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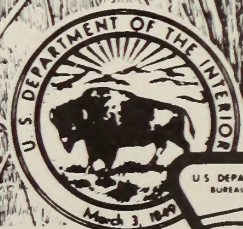


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# BLOOMFIELD—NORTH FORK BASELINE INVENTORIES—WILDLIFE



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Bureau of Land Management  
Miles City District Office  
Miles City, Montana  
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United States Department of the Interior  
Bureau of Land Management

## Bloomfield—North Fork Baseline Inventories — Wildlife

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## ABSTRACT

The Bureau of Land Management (BLM) recently completed a wildlife study on two potential coal lease tracts in the Fort Union Coal Region. One area, the Bloomfield coal tract, is approximately 26 square miles and the North Fork coal tract (Woodson Preference Right Lease Application) is approximately 21 square miles. Wildlife data obtained from this study was used to apply coal lease unsuitability criteria to these areas and to make responsible decisions on the possible coal leasing of these tracts.

Major habitats on the areas included: grasslands (the prevalent natural vegetation), hardwood draws, creek bottoms, badlands, agricultural lands, and small patches of sagebrush.

Information was collected on the occurrence, relative abundance, and habitat relationships of all wildlife species on these areas. All information, except small mammal trap data, was placed in the BLM computer for data analysis.

Major game species for the two areas included mule deer, white-tailed deer and antelope. Mule deer habitat occurred from the Sheep Mountain Divide and the area west of there on the Bloomfield study area and in the uplands on the North Fork study area. White-tailed deer were seen throughout the Bloomfield study area but were

more or less confined to the creek bottom on North Fork. Only a few observations of antelope were recorded on either study area.

Upland game birds included sharp-tailed grouse, ring-necked pheasant, gray partridge and Merriam's turkeys. Seven sharp-tailed grouse arenas were located on the North Fork tract versus two arenas on the Bloomfield tract. Ring-necked pheasants were found in the creek bottoms and woody draws. Only one gray partridge was seen. A flock of Merriam's turkeys was observed several times on the North Fork study area; however, they spend most of their time somewhat south of there.

There was very little utilization of either study area by waterfowl. Only a few reservoirs occurred on the Bloomfield study area and most of the North Fork of Burns Creek dried up after spring runoff.

Raptor utilization of both areas was relatively low; however, nests of prairie falcons and golden eagles were located.

Non-game species included: three species of amphibians and four species of reptiles, 52 species of birds (Bloomfield) versus 76 species (North Fork), and 15 mammals (Bloomfield) versus 17 mammals (North Fork).

## ACKNOWLEDGEMENTS

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The following BLM personnel in the Montana State Office provided assistance in data analysis and cartographic work: Don Johnson, Rose

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Most of the landowners were very helpful and cooperative, allowing access to their land and providing information about wildlife on their land. Montana Department of Fish, Wildlife, and Parks personnel in Region 7 were very helpful, with special thanks due to Jon Swenson and Arnold Dood.



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# INTRODUCTION

## BACKGROUND

The Bureau of Land Management (BLM) is a federal land management agency charged with the responsibility of managing surface resource values on public lands and administering federal mineral estates on lands overlain by private surface. Because of the present energy situation, there has been an increased interest in coal. Vast amounts of coal exist within eastern Montana, but little information is available for other resource values on these areas.

Because of a need for additional leasing of federal coal, a Federal Coal Management Program was established. The purpose of this program is to provide for an orderly development of federal coal resources by private industry and to direct development in areas where environmental impacts can be minimized. In 1980 the Fort Union Regional Coal Team, made up of federal, state and local officials, was established. In conjunction with BLM, this team identified and screened 24 tracts of coal reserves in the Fort Union Coal Region of eastern Montana and western North Dakota, plus one Preference Right Lease Application (PRLA) tract for evaluation of potential coal leasing scheduled by the Secretary of Interior for June 1983. Before these areas can be leased, other resource values which might be impacted or affected by coal leasing must be considered. Presently, BLM considers private surface landowner consent and all resource values/uses to identify areas as suitable or unsuitable for surface coal mining.

In November 1980, BLM initiated an inventory on two of these potential coal lease tracts, Bloomfield and North Fork. The Bloomfield tract was identified by the Fort Union Regional Coal Team; however, the North Fork tract was a PRLA that Fred C. Woodson Oil Properties filed in June 1977. The two potential coal lease tracts were considered as separate study areas for wildlife inventory purposes. These areas were studied to determine the wildlife resource values and to address the wildlife unsuitability criteria for coal leasing. The objectives of the study were as follows:

- 1) Identify and document the occurrence and distribution of the wildlife on the study areas.
- 2) Identify and document crucial wildlife habitat on the study area, i.e., big game wintering grounds, sharptailed/sage grouse arenas, et cetera.
- 3) Identify and document the actual habitat utilization of these areas by wildlife species,

e.g., seasonal use areas, migration routes, if known.

- 4) Identify and document any habitat conflicts or problems with the present utilization of these areas for wildlife species.
- 5) Identify suitable, but unoccupied, habitat for wildlife species.
- 6) Identify and document any endangered species or endangered species critical habitat on the study area.

The Bloomfield—North Fork inventory was set up for a one year study (four seasons). Data collection commenced in November 1980 and terminated in October 1981. It should be noted that field time on these areas was considerably reduced because of several federal budget cuts in travel expenditures and operational costs. With these constraints, every effort was made to collect the essential data needed to satisfy unsuitability criteria and state requirements; however, this effort was minimal.

## DESCRIPTION OF THE STUDY AREAS

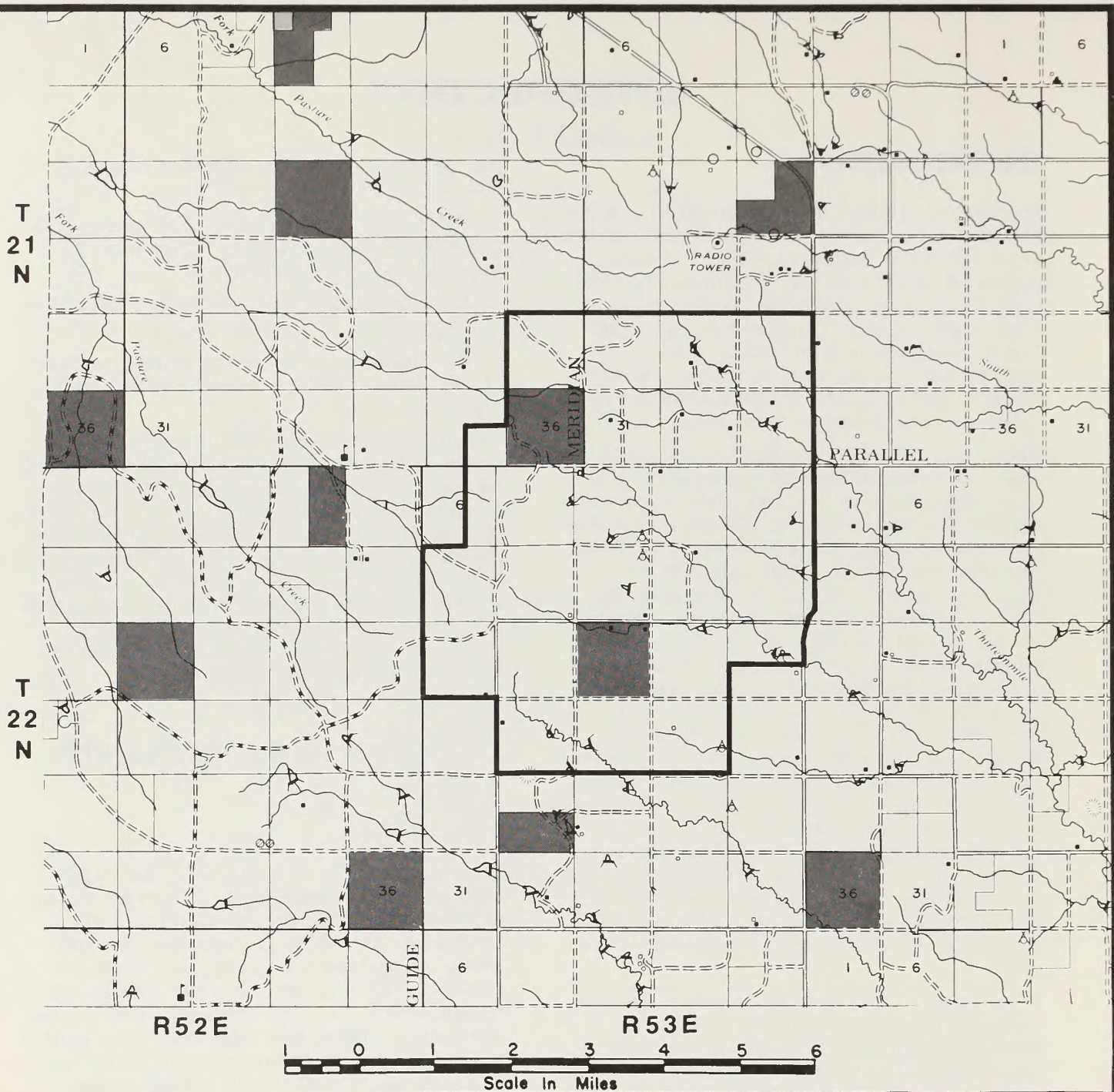
### Bloomfield

The Bloomfield study area encompassed 26 square miles (approximately 16,470 acres) and was located in Dawson County (Figure 1). Boundaries for the area were somewhat arbitrarily determined to coincide with the boundaries of the coal tract. The study area and its relationship to the state of Montana is shown in Appendix A. The surface ownership was divided as follows: private landowners (15,190 acres) and state land (1280 acres). The subsurface coal mineral estate of the proposed mine site is 9 percent federal, with the remainder in state and private ownership.

### North Fork

The North Fork study area encompassed 21 square miles (approximately 13,459 acres) and was located in Dawson and Richland counties (Figure 2). Boundaries for the area generally coincided with boundaries of the coal tract. The study area and its relationship to the State of Montana is shown in Appendix A. The surface ownership was divided as follows: private landowners (12,959 acres) and state land (3,500 acres). The subsurface coal mineral estate of the proposed mine site is 34 percent federal, with the remainder in state and private ownership.





## BLOOMFIELD STUDY AREA

Bloomfield Study Area



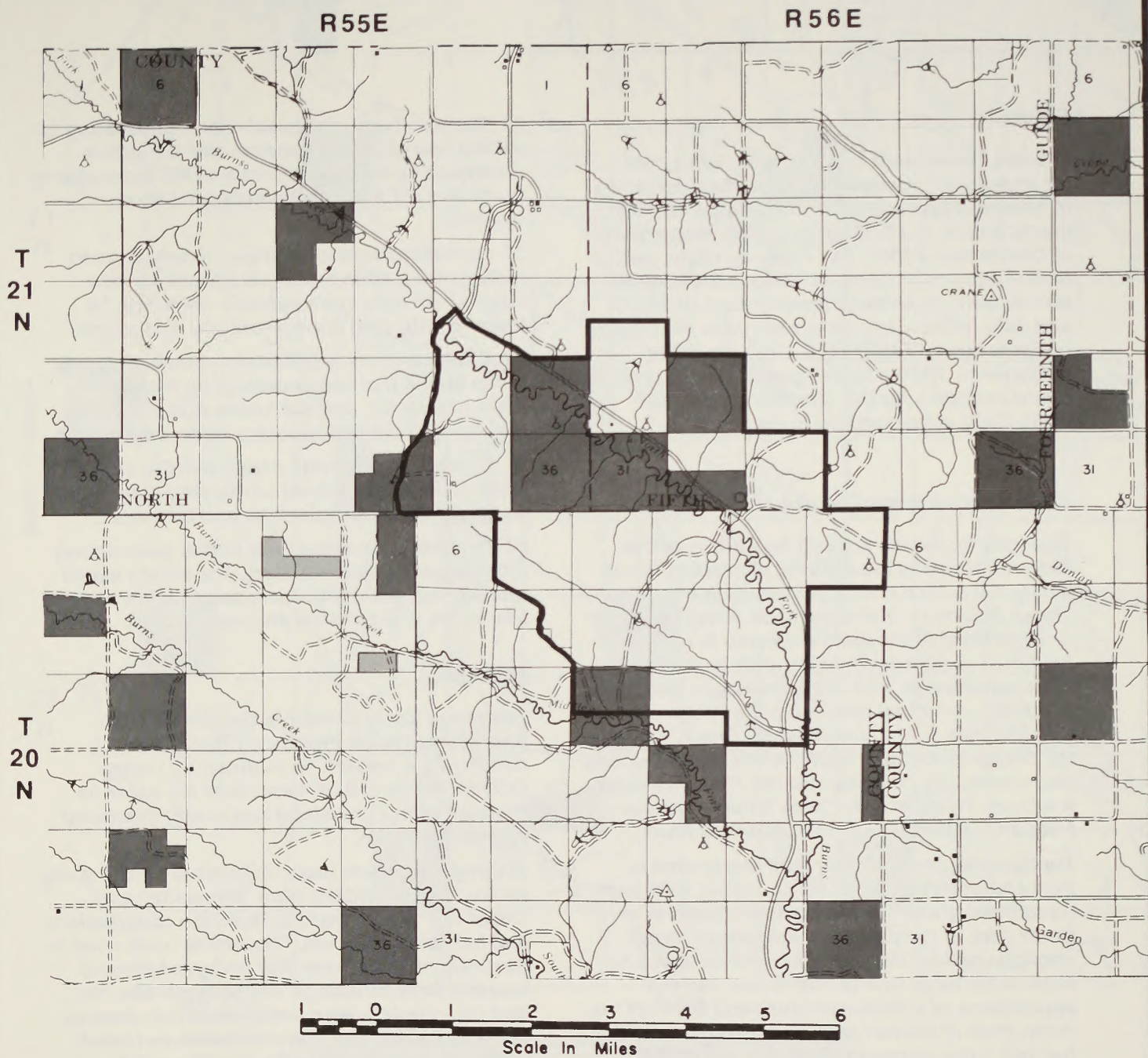
BLM LAND



STATE LAND

FIGURE 1





## NORTH FORK STUDY AREA

North Fork Study Area



- BLM LAND
- STATE LAND

FIGURE 2



## **Climate**

Climate for the area is continental with cold winters, warm summers and marked variation in seasonal precipitation. The annual average precipitation is 13.82 inches, (U.S. Department of Commerce 1980). The majority of the precipitation occurs in June. January is the coldest month with an average temperature of 14.9°F and July is the warmest month with an average temperature of 74.0°F (U.S. Department of Commerce, 1980-81). Temperature and precipitation averages for the Glendive station for 1980-1981 are presented in Appendix B.

## **Topography and Soils**

Topography for the eastern two-thirds of the Bloomfield study area is best characterized as nearly flat with a few slightly rolling hills. The Sheep Mountain Divide extends along the western one-third of the area. This area is characterized by a badlands complex with broken ridges, high benchlands, and deep drainages that slope northerly. Principal drainages are Pasture Creek and Thirteen Mile Creek. Pasture Creek, east of the Sheep Mountain Divide, flows northwesterly and eventually empties into the Missouri River; whereas, Thirteen Mile Creek flows southeasterly and drains into the Yellowstone River.

Topography for the North Fork study area is best characterized as flat with rolling hills scattered throughout the valley floor. South of the North Fork of Burns Creek, the terrain forms strongly rolling, dissected sandstone uplands with some large scoria buttes and has the appearance of a badlands complex. North of the North Fork of Burns Creek, the terrain is similar but not quite as rough as the terrain to the south.

Soils for the areas fall within six main associations briefly described below (URA - .35 Soils). Only three soil associations were found on the Bloomfield study area (Lambert-Dimyaw; Shambo-Lambert; and Famuf-Turner); whereas, five soil associations were found on the North Fork study area (Lambert-Dimyaw; Zahill-Lambert; Cherry; Trembles, Havreton and Lohler; and Famuf-Turner).

These soil associations are described as follows:

1) Lambert-Dimyaw association - steep to very steep, deep silt loams and silty clay loams underlain by silt loam, silty clay loam, or silty clay sedimentary beds; on uplands.

2) Shambo-Lambert association - undulating to rolling and hilly, deep loams and silt loams underlain by stratified loam and silt loam alluvium and silt loam sedimentary beds; on uplands.

3) Famuf-Turner association - nearly level to rolling, deep soils that have a loam surface layer and a clay loam subsoil, underlain by loam to silty clay loam alluvium; on uplands.

4) Zahill-Lambert association - steep and very steep loams that are underlain by friable clay loam glacial till, and silt loams that are underlain by silt loam sedimentary beds; on uplands.

5) Cherry association - nearly level to sloping, deep soils that are dominantly silty clay loam throughout; on alluvial fans and terraces.

6) Trembles, Havreton, and Lohler association - level to gently sloping, deep fine sandy loams and silt loams underlain by sandy loam and silt loams; on low terraces and flood plains.

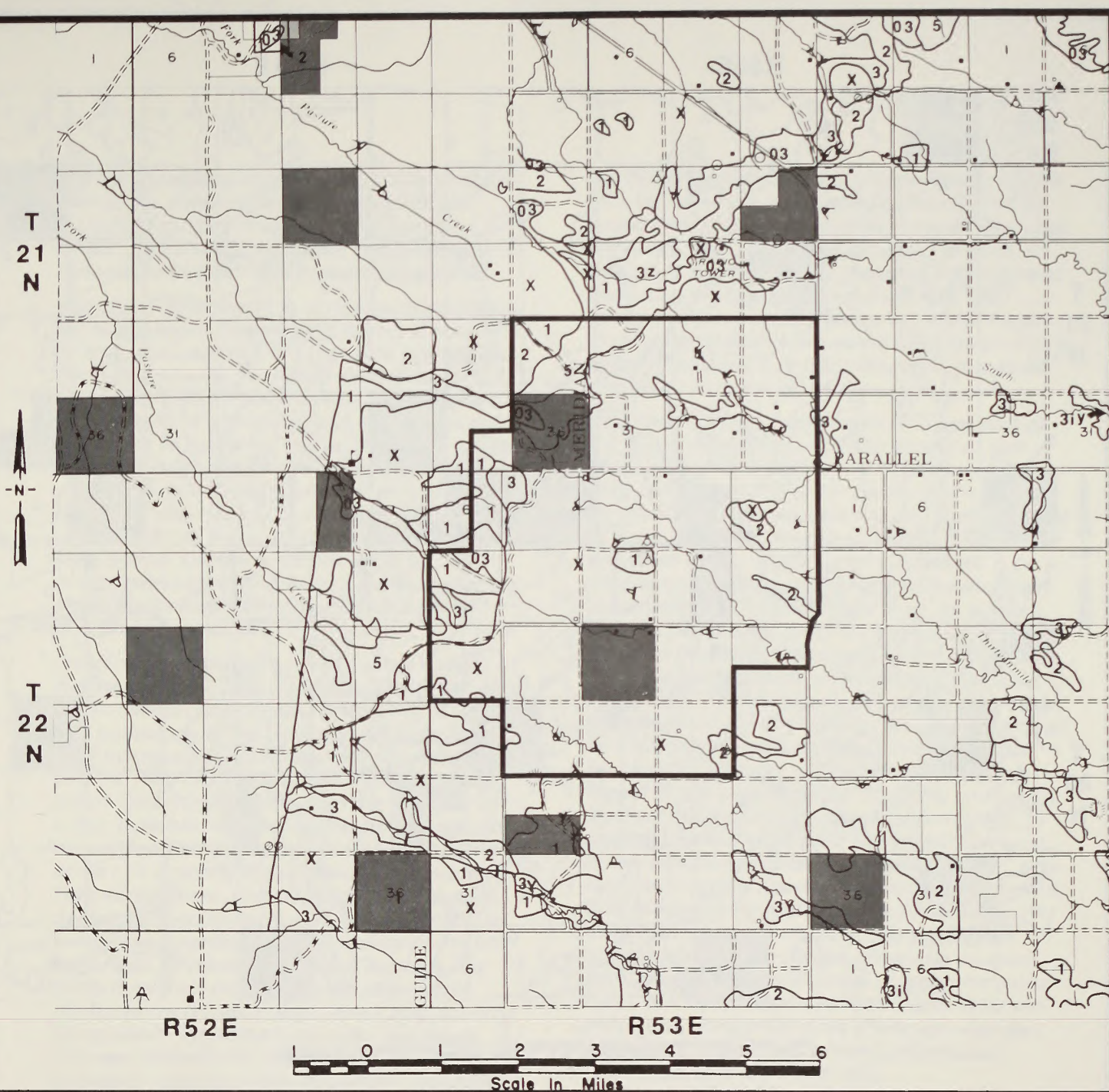
## **Habitats**

The study areas lie within the Great Plains - Shortgrass Prairie Province Wheatgrass-Needlegrass Section as outlined by Bailey (1978). Payne (1973) described the areas as Prairie County grassland and sandy grassland vegetation types.

Six major habitats were delineated on the study areas. These habitats, plus "homesite" and "reservoir", were used to describe observations and habitat utilization. "Homesite" was used to describe observations that occurred around houses, farm buildings, old homesteads, etc., and "reservoir" was used to describe observations that were made at reservoirs and small potholes. Habitat types for the Bloomfield and North Fork study areas are shown in Figures 3 and 4, respectively. Habitat types and their descriptions were taken from the Richland-Glendive Planning Unit Resource Analysis and are briefly described below (URA.34 Vegetation).

Grasslands are the prevalent natural vegetation types on the study areas. They comprised 1,221 acres or 7 percent of the Bloomfield area and 6,124 acres or 45 percent of the North Fork area. Grasslands were found in almost all landforms from flat areas to large buttes and occurred on practically all soil types. Dominant grasses were western wheatgrass (*Agropyron smithii*), needle-and-thread (*Stipa comata*), blue grama (*Bouteloua gracilis*), buffalograss (*Buchloe dactyloides*), junegrass (*Koeleria cristata*),





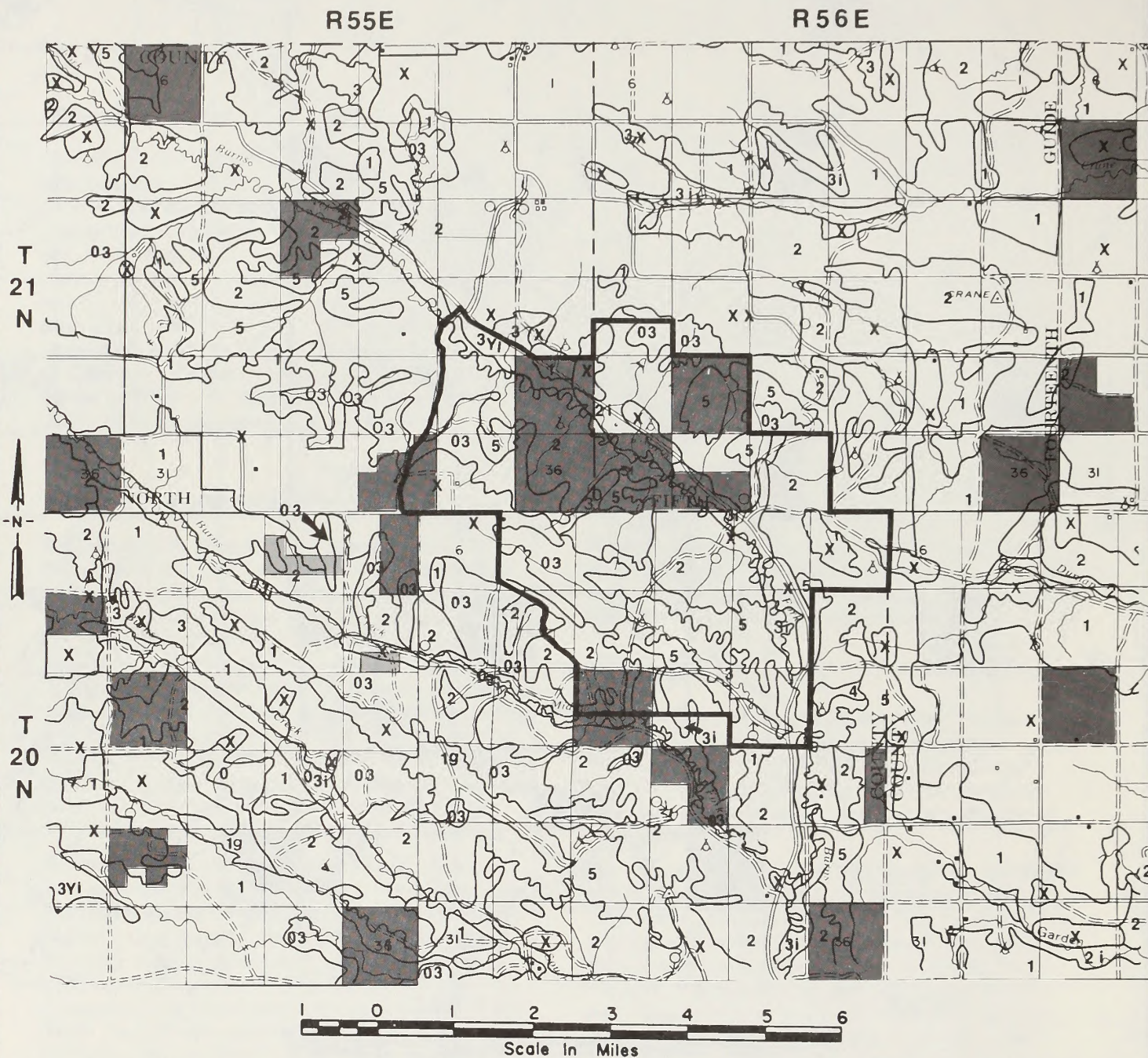
## BLOOMFIELD HABITAT TYPES

### LEGEND

- |                        |                           |
|------------------------|---------------------------|
| 1 GRASSLANDS           | 4 SALINE SHRUB            |
| 2 SAGEBRUSH GRASSLANDS | 01 Conifers               |
| A Big Sagebrush        | 02 Creek                  |
| B Silver Sagebrush     | 03 Upland Hardwood Stands |
| 3 HARDWOOD DRAW        | 5 BADLANDS                |
| Z Tall Shrubs          | X AGRICULTURE             |
| Y Short Shrubs         | f Cliffs                  |
|                        | g Vegetated Butte Tops    |
|                        | i Semi Permanent Streams  |

FIGURE 3





## NORTH FORK HABITAT TYPES

### LEGEND

- |                        |                           |
|------------------------|---------------------------|
| 1 GRASSLANDS           | 4 SALINE SHRUB            |
| 2 SAGEBRUSH GRASSLANDS | 01 Conifers               |
| A Big Sagebrush        | 02 Creek                  |
| B Silver Sagebrush     | 03 Upland Hardwood Stands |
| 3 HARDWOOD DRAW        | 5 BADLANDS                |
| Z Tall Shrubs          | X AGRICULTURE             |
| Y Short Shrubs         | f Cliffs                  |
|                        | g Vegetated Butte Tops    |
|                        | i Semi Permanent Streams  |
- BLM LAND  
 STATE LAND

FIGURE 4



and the threadleaf sedge (*Carex filifolia*). Common forbs, a minor part of this vegetation, include breadfoot scurfpea (*Psoralea esculenta*), yucca (*Yucca glauca*), fringed sagewort (*Artemisia frigida*), and numerous annuals.

Sagebrush was found in very few locations on the study areas. Even where found, it was more or less small patches or clumps of sagebrush interspersed with grassland rather than large continuous expanses. It comprised 187 acres or 1 percent of the Bloomfield study area and 842 acres or 6 percent of the North Fork study area. Although sagebrush was generally found on the uplands, it also occurred in portions of the major drainages. Common grasses were western wheatgrass, needle-and-thread, and blue grama. Common shrubs were big sagebrush (*Artemisia tridentata*), silver sagebrush (*Artemisia cana*), winterfat (*Eurotia lanata*), and fringed sagewort.

Hardwood draws were found on the upper reaches of the drainages on the areas. The vegetation varied considerably according to the size and hydrology of the drainage. In many cases, they intergraded with the creek vegetation type and the only criteria that distinguished hardwood draws from creeks was the absence of water in hardwood draws. Hardwood draws comprised 716 acres (4 percent) and 1351 acres (10 percent) of the Bloomfield and North Fork study areas, respectively. Characteristic overstory species included: green ash (*Fraxinus pennsylvanicus*) and box elder (*Acer negundo*). Common brushland species that formed an understory in some cases were chokecherry (*Prunus virginiana*), buffaloberry (*Shepherdia argentea*), red osier dogwood (*Cornus stolonifera*), and Wood's rose (*Rosa woodsii*). Grasses, such as western wheatgrass and blue grama, formed the ground cover.

Creek vegetation type was found along Thirteen Mile Creek on the Bloomfield study area and along Burns Creek on the North Fork study area. As stated previously, there was some intergradation of vegetation between hardwood draws and creeks. In many cases, the distinguishing criterion for the two was that creeks were classified as such when there was water in a major drainage most of the time. Creek vegetation comprised 21 acres (0.1 percent) on the Bloomfield study area and 466 acres (4 percent) on

the North Fork study area. Characteristic species included the same species found in hardwood draws, plus plains cottonwoods (*Populus deltoides*) and willows (*Salix* spp.) in the overstory and smooth brome (*Bromus inermis*) and Kentucky bluegrass (*Poa pratensis*) in the ground cover. In many areas, the creek vegetation changed from a broadleaf tree complex to a mesic grassland complex; however, it was all classified as creek vegetation type.

Badlands comprised 92 acres (0.6 percent) of the Bloomfield tract and 1450 acres (11 percent) of the North Fork tract. This figure is probably somewhat higher for the Bloomfield tract as the Sheep Mountain Divide and the area west of it are badlands. However, aerial photointerpretation of this area resulted in a more detailed separation of the various habitat components that occurred on the area. As a result, only the sandstone outcroppings were classified as a badlands complex when the entire divide is really a badlands complex. The badlands varied considerably in plant community composition. Generally, they are best described as a mosaic of vegetation and land form that includes portions of sagebrush-grasslands/mesic shrub communities, conifers, and broadleaf trees that occur on rough broken topography. For the most part, the vegetation type was a function of geological structure, i.e., scoria buttes versus sandstone pinnacles. No effort was made to distinguish types of badlands. Common species included: big sagebrush, rubber rabbitbrush (*Chrysothamnus nauseosus*), bluebunch wheatgrass (*Agropyron spicatum*), Rocky Mountain juniper (*Juniperus scopulorum*), ponderosa pine (*Pinus ponderosa*), creeping juniper (*Juniperus horizontalis*), green ash, and American elm.

Agricultural lands comprised 14231 acres (86 percent) on the Bloomfield study area and 3,225 acres (24 percent) on the North Fork study area. The majority of this land was found along creeks and level to slightly rolling plains. Wheat (*Triticum* spp.) and oats (*Avena sativa*) were common small grains on both study areas, but they were the predominant habitat on the Bloomfield tract. Hay meadows of alfalfa (*Medicago sativa*) and cultivated grasses were also grown, but were more common on the North Fork study area.







# MATERIALS AND METHODS

Techniques used to inventory wildlife species on the study areas varied according to species and the amount of data that was needed. All procedures were standardized techniques needed to conduct a systematic habitat inventory. All vertebrate species that were encountered, i.e., amphibians, reptiles, birds, and mammals were identified and recorded.

## GAME SPECIES

A windshield survey route was established and used to obtain data on game species (Appendices C and D). The routes were selected based on their year-round accessibility. Normally, the routes were run during early morning or late evening hours when game species' activities were greatest. Each route was run a minimum of twice each month. Information recorded were species, location, sex and age class, numbers, and habitat type. All vertebrate species were recorded by this technique, except during the summer period when the more abundant species of birds were not recorded by this technique.

Incidental observations were often made while transversing the study areas by vehicle and foot. Most of this information was collected while looking for grouse leks, small mammal trapping, etc.

Aerial surveys were made in early April using a helicopter for low-level flights over both study areas. The entire study areas were transversed by flying grid transects and likely areas during early morning hours. Specific information, such as locations of raptor nests and sharp-tailed grouse arenas were collected by this technique. A sharp-tailed grouse arena survey was conducted during late March-early May. Arenas were located by periodically stopping the vehicle (approx. every mile) and listening for lekking grouse. Most arenas, once located, were checked at least twice to insure that the location was the actual arena and not just a social interaction of lekking males during this period and to try to determine the maximum number of males attending the arena. Information was recorded on grouse arena forms and is on permanent file at BLM in Miles City.

Waterfowl were censused by visiting reservoirs and creeks during early spring and summer. Broods were recorded when observed.

## NON-GAME SPECIES

### Amphibians and Reptiles

Amphibians and reptiles were identified when they were encountered on the study areas. Occasionally, springs, creeks, and other areas were visited to obtain specific information on amphibians and reptiles.

### Birds

Two vehicle routes (one route for each study area) were established to census non-game birds (Appendices E and F). The route survey was a modification of the Breeding Bird Survey (Robbins and Van Velzen, 1967). Each route, 25 stops in length with stops spaced one-half mile apart, was run once a month from May-August, except during June when routes were run twice. All wildlife species seen along the routes were recorded according to the predominant habitat in which they were observed. The rationale behind these modifications was to insure that sufficient data on migrant/breeding birds, as well as other wildlife species, were collected. Actually, the technique was used more as a systematic method of data collection rather than as an actual breeding bird survey.

Raptor nests were located by searching likely areas by foot, vehicle, and helicopter. Creek bottoms, cliffs, bluffs, et cetera were searched during early spring-early summer. Information gathered was recorded on raptor nest inventory forms and is on permanent file at BLM in Miles City.

Incidental observations of unusual or uncommon bird species observed while transversing the study areas were also recorded.

### Mammals

Small mammals were trapped in each of the five habitats during the fall. (Appendices E and F). Traplines consisted of 25 stations approximately ten yards apart with four traps per station. A Sherman live trap and three snap traps (rat trap every third station) were set at each station. A mixture of peanut butter and oatmeal was used as bait. Traplines were set and checked daily for three successive nights. All small mammals captured were exterminated and identified. Questionable or unusual specimens were sent to Montana State University



*Zoological Museum for verification and storage. Traps which were sprung but empty were subtracted from the total trap nights as a correction factor in data tabulation.*

*Incidental observations of furbearers, predators, and other non-game mammals observed on the study areas were also recorded. All data, except small mammal trap data, was computerized and summarized on the BLM's computer terminal in Billings, Montana. All original data and computer print-outs are permanently filed at BLM's District Office in Miles City, Montana.*



## RESULTS AND DISCUSSION

All major wildlife species are discussed separately in their respective sections and by separate study areas. The relative abundance for each species was determined by their frequency of capture or number of observations, plus information from landowners/residents and previous studies in this area. Habitat utilization, for the most part, is merely a listing of species, the number of observations, and the habitats in which they were observed. This is not meant to imply a habitat preference by a particular species, but rather, habitat utilization by a species as observed in this study. In most cases, the sample size of observations of a particular species was too small to show any definite habitat preference.

### BLOOMFIELD

#### Game Species

##### Mule Deer

Mule deer production and population characteristics are shown in Appendix G and harvest statistics are shown in Appendix H. The sample size of mule deer observations was too small to determine population structure. Group size varied from 1-14 mule deer; however, most observations were of small groups (2-6 mule deer) and generally consisted of does with fawns.

Mule deer distribution is shown in Figure 5. Most observations were scattered along or near the Sheep Mountain Divide. Observations east of there were primarily mule deer moving into the small grain fields to feed. For the most part, mule deer were not concentrated and were widely distributed along the divide because of a very mild winter during 1980-81; however, Swenson (1980) mapped mule deer winter ranges in the area for the winters of 1977-78 (Figure 6). He showed 4.8 mule deer/square mile for the area along the divide and the area west of there. Most of the mule deer observations were made in the badlands complex. Although there was some utilization of the small grain fields for feeding mostly during the fall-winter period, the badlands complex was the most important area for mule deer. The Sheep Mountain Divide and the area west of it should be considered crucial mule deer habitat.

##### White-tailed Deer

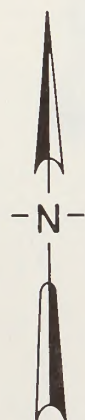
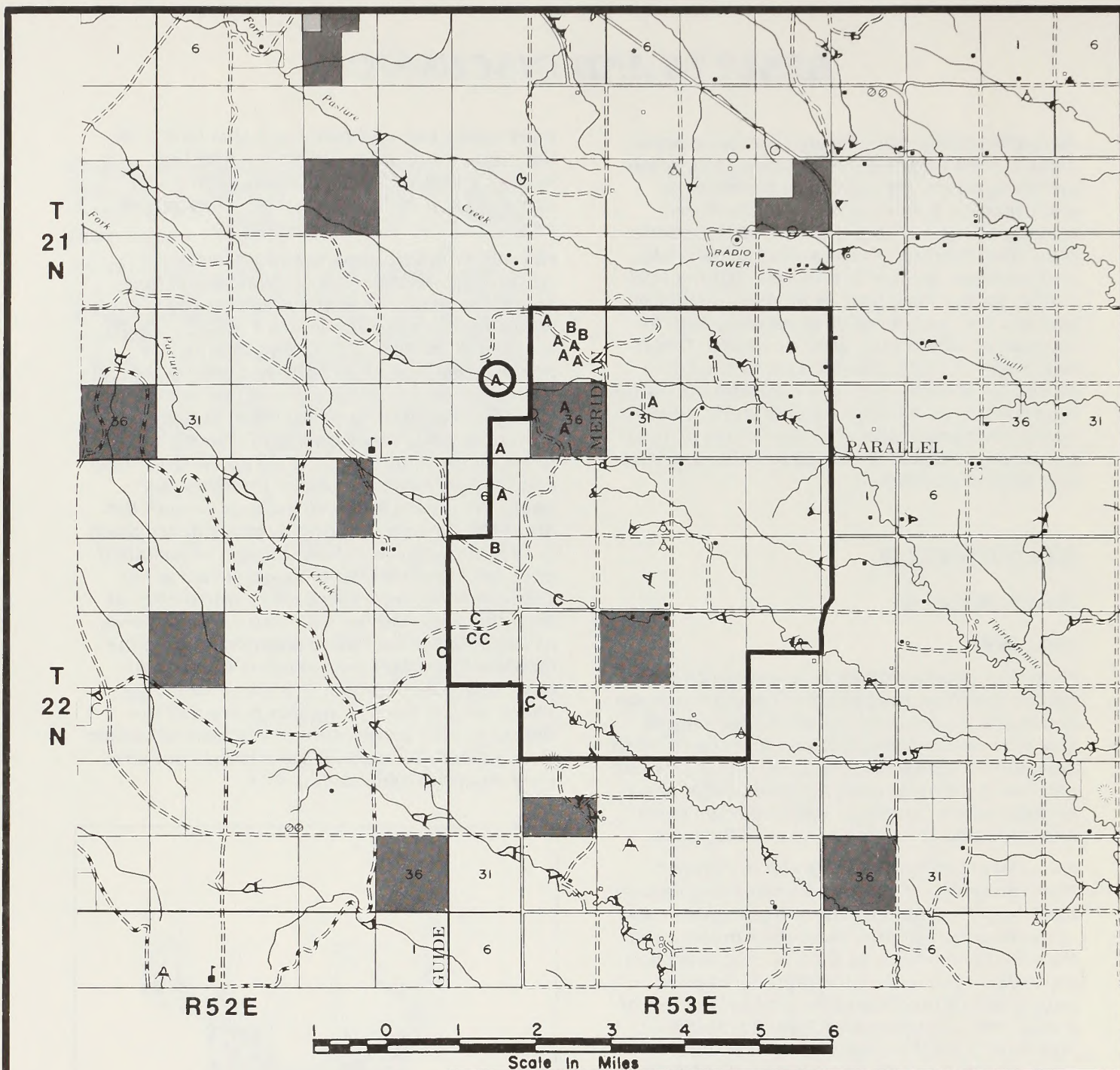
White-tailed production and population characteristics are shown in Appendix G and harvest statistics are shown in Appendix H. Population structure is shown in Appendix G. Although

there was a low incidence of bucks (4.8%) in the population, other figures such as the fawns: 100 does were comparable to Swenson's (1981) figures for Region 7. Group size ranged from 1-20 white-tailed deer.

Fall-winter distribution is shown in Figure 7. Most of the observations cluster around two areas. The first area on the northern end of the study area is a woody draw on the uppermost reaches of Thirteen Mile Creek. This area is dense brush and small trees and provides excellent cover for white-tailed deer. The second area, just south of the study area, is a small farm with a few small grassy hills and grain fields where a herd of up to 20 white-tailed deer congregate, feeding in the grain fields and using the grassy hills and the area around the homesite for cover. Spring-summer distribution is shown in Figure 8. Even though white-tailed deer still remained in the woody draw along Thirteen Mile Creek, there was some dispersal from this area and the southern wintering area as white-tailed deer were often seen along the divide and another area south of the woody draw along the Thirteen Mile Creek drainage. There are few trees along this portion of the drainage, and it was more of a grassland coulee than a creek or woody draw and was not used very much by white-tailed deer.







## MULE DEER OBSERVATIONS

### LEGEND

- A Spring
- B Summer
- C Fall
- D Winter
- O (Circled Letter)  
Group of Ten or More

- BLM LAND
- STATE LAND

FIGURE 5

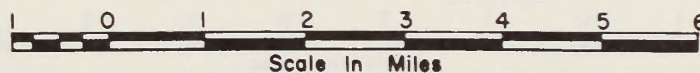


T  
21  
N

T  
22  
N

R52E

R53E



10.1 WT DEER/Sq Mi

4.8 M DEER/Sq Mi

22.3 WT DEER/Sq Mi

GUIDE

RADIO  
TOWER

PARALLEL



## DEER WINTERING AREAS

### LEGEND

Area—Density of deer for that particular area

### SOURCE:

Big Game Survey and  
Inventory (Deer)  
Region 7 1980  
Montana Department of Fish,  
Wildlife and Parks

-  BLM LAND
-  STATE LAND

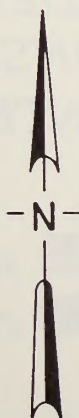
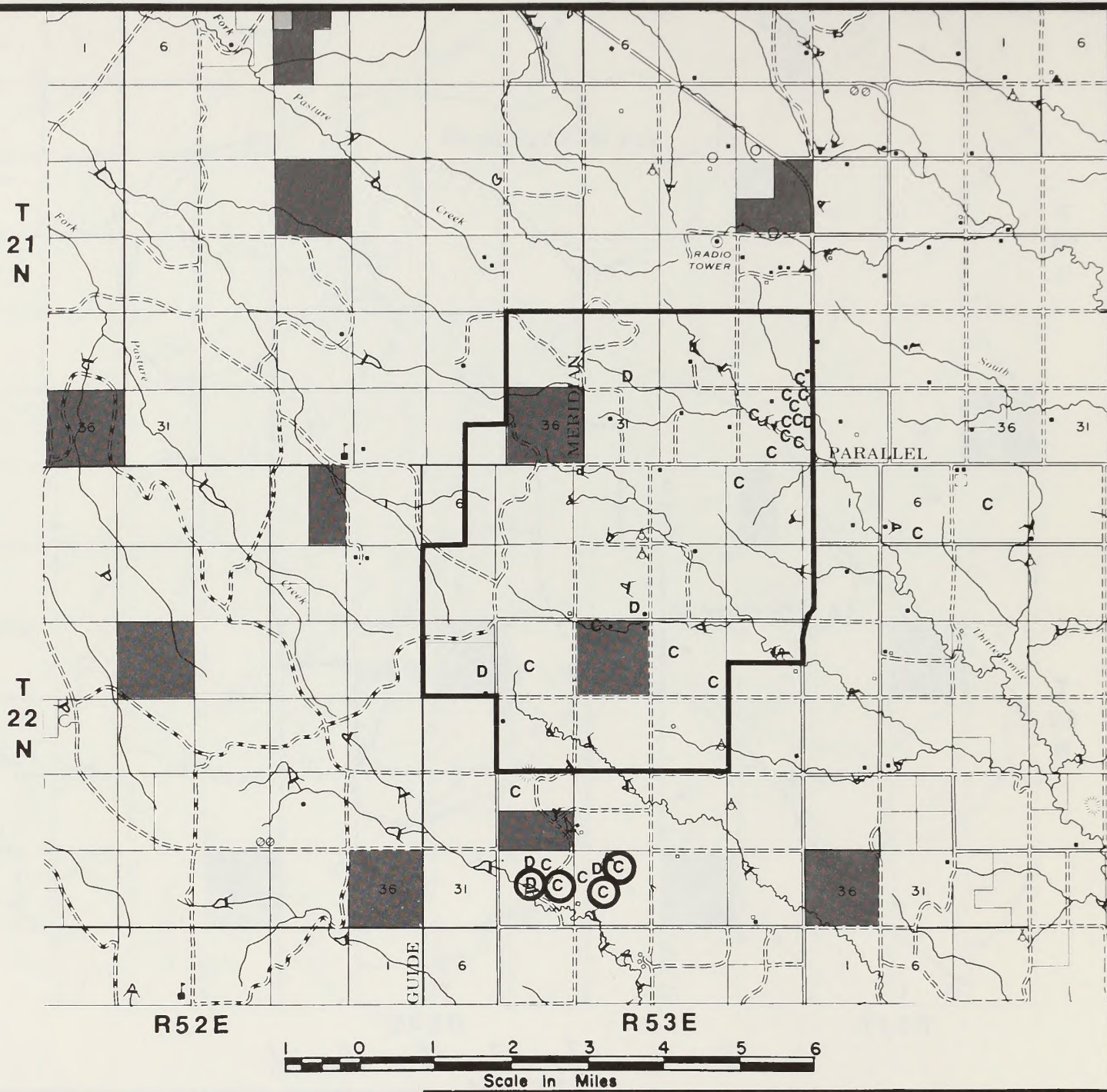


FIGURE 6

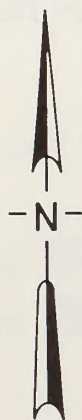




R 52 E

R 53 E

Scale In Miles



## WHITE-TAILED DEER OBSERVATIONS FOR FALL—WINTER

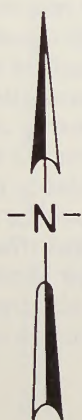
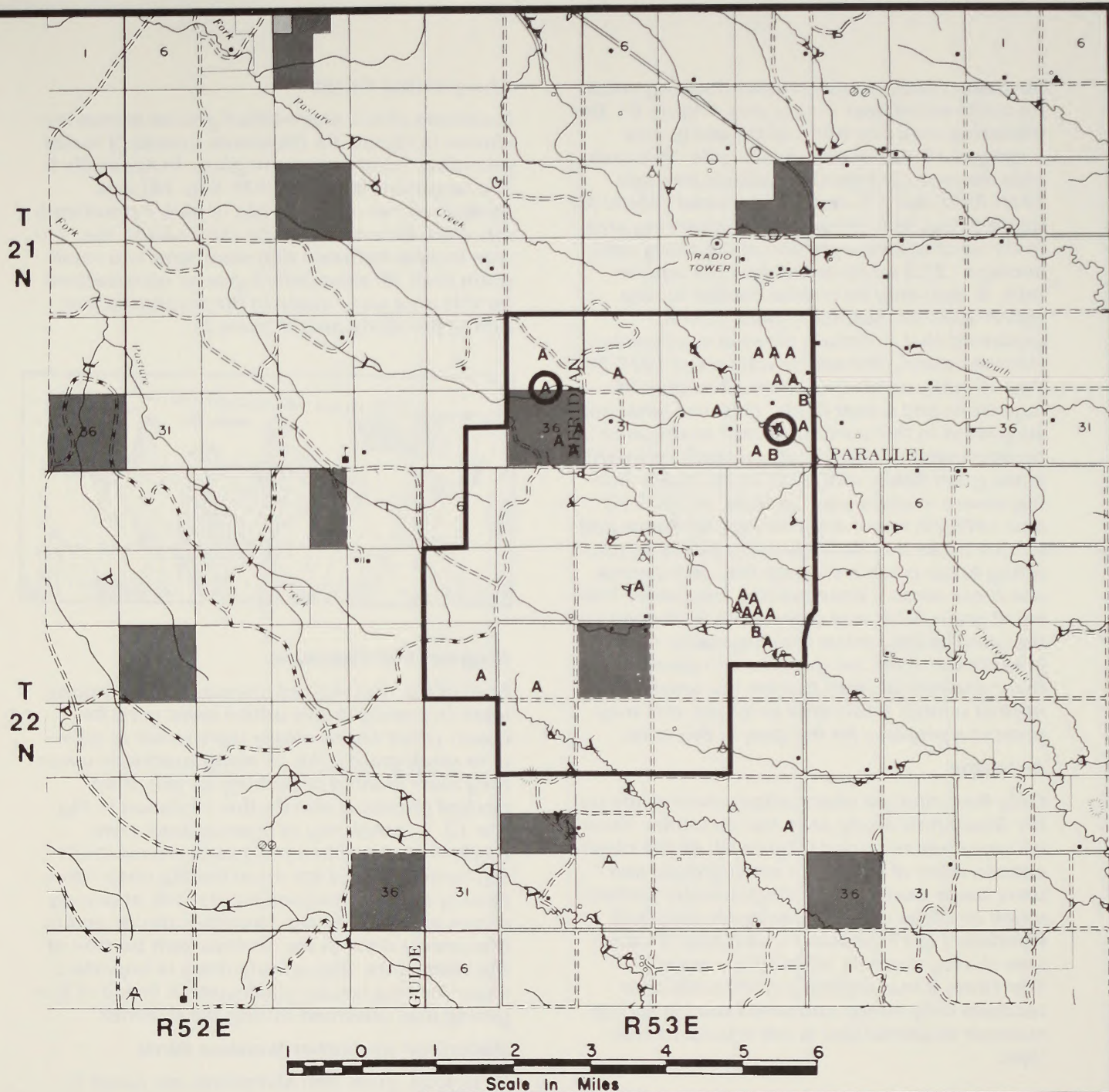
### LEGEND

- C Fall
- D Winter
- O (Circled Letter)  
Group of Ten or More

- BLM LAND
- STATE LAND

FIGURE 7





## WHITE-TAILED DEER OBSERVATIONS FOR SPRING—SUMMER

### LEGEND

- A Spring
- B Summer
- O (Circled Letter)  
Group of Ten or More



-  BLM LAND
-  STATE LAND

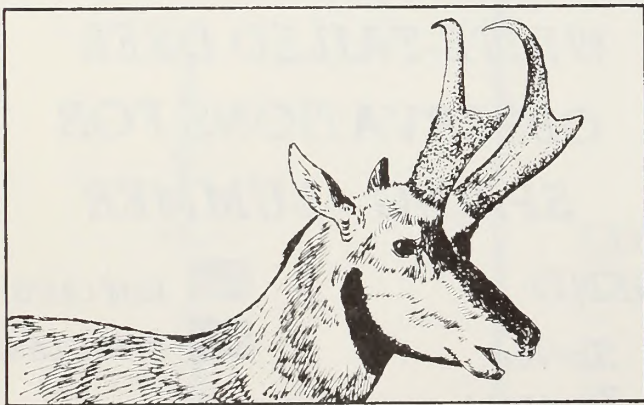
FIGURE 8



Swenson (1980) mapped two wintering areas for white-tailed deer in this area (Figure 6). The wintering area just north of the study area averaged 10.1 deer per square mile. This area, plus the woody draw that extends through T21N R53E Sec. 28 and 33, is crucial habitat for white-tailed deer. Although the wintering area in the southwestern portion of the study area averaged 22.3 white-tailed deer per square mile, it may only be crucial habitat during severe winters. Swenson (pers. comm.) explained that in certain areas in southeastern Montana during the severe winters of 1977-78 that as many as 50 deer were often seen in haystacks and wheat fields. This was what we suspected in this particular case as this area is predominately flat agricultural lands (primarily small-grain fields) with little or no cover. During severe winters such as those of 1977-78 and 1978-79, snow depth in woody draws and similar areas that deer normally utilize as wintering areas is often so deep that deer cannot use these areas. Consequently, they move into small grain fields and other areas kept open by the wind or they move into haystacks to find food. These areas are important to deer during these extreme periods but are not used in a normal winter. If this area is mined, this may present a problem for the deer in this area.

### **Antelope**

Only five antelope observations were made on the Bloomfield study area and no winter observations were recorded (Figure 9). All the observations were of singles or small groups and were made during the spring-summer periods when antelope are at a maximum dispersal. Wentland (1977) showed no antelope in this area during summer distribution surveys. Therefore, it was determined that this area receives only minor utilization during spring-summer dispersal and is not crucial to antelope.



### **Sharp-tailed Grouse**

Locations of two sharp-tailed grouse arenas are shown in Figure 10. Maximum counts of males attending these arenas are given in Appendix I. The larger arena (T20N R53E Sec. 18) was located on top of a large hill in native grassland; whereas, the smaller arena (T20N R53E Sec. 20) was located between two reservoirs in a small-grain field. All sharp-tailed grouse observations for this area were made in the southwest portion of the study area (Figure 11).



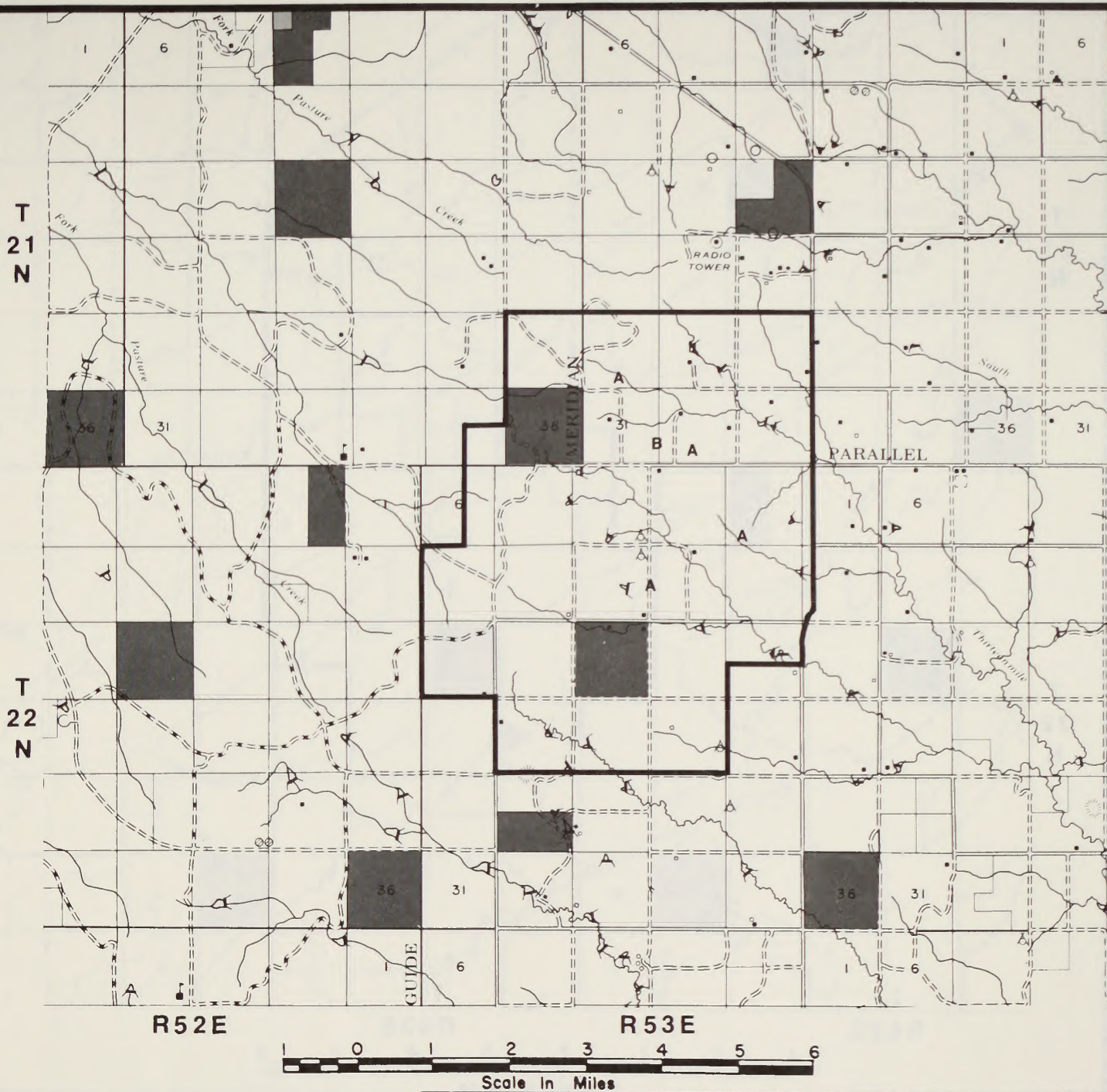
### **Ring-necked Pheasant**

Most of the ring-necked pheasant observations were in woody draws which were used for cover. Other observations were made in adjacent small-grain fields or along roadsides when they were feeding or picking up grit. Ring-necked pheasant distribution is shown in Figure 12. The majority of observations were made in spring when pheasants are establishing territories and are more readily observable. Most of the observations were made in woody draws along the Sheep Mountain Divide and in the woody draw in the northeastern portion of the study area. This woody draw is important cover for ring-necked pheasants. A brood of five young was observed during the summer.

### **Waterfowl and other Wetland Birds**

Waterfowl, gulls, and shorebirds are listed in Table 2. The only wetland habitats of any importance were some small reservoirs on the upper reaches of Thirteen Mile Creek. Even so, there was only minimal utilization of this area by waterfowl. Although mallards were the only waterfowl species recorded, other dabbling duck species such as blue-winged teal, green-winged teal, and pintails probably use these reservoirs. However, these species were missed during the study period. The reservoirs were too small and shallow for diving ducks. Killdeer, the only shorebirds observed, nested on the area. Ring-billed gulls were observed flying over the area.





## ANTELOPE OBSERVATIONS

### LEGEND

A Spring  
B Summer

BLM LAND  
STATE LAND

FIGURE 9

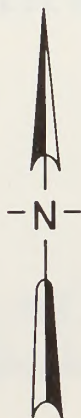
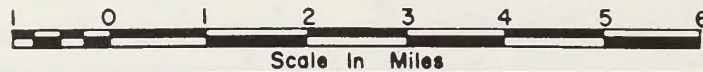


T  
21  
N

T  
22  
N

R52E

R53E



## SHARP-TAILED GROUSE STRUTTING GROUNDS

- BLM LAND
- STATE LAND

FIGURE 10

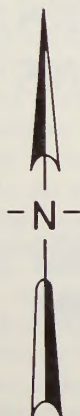
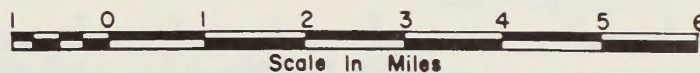


T  
21  
N

T  
22  
N

R 52 E

R 53 E



## SHARP-TAILED GROUSE OBSERVATIONS

### LEGEND

A Spring

B Summer

C Fall

D Winter

O (Circled Letter)

Group of Ten or More



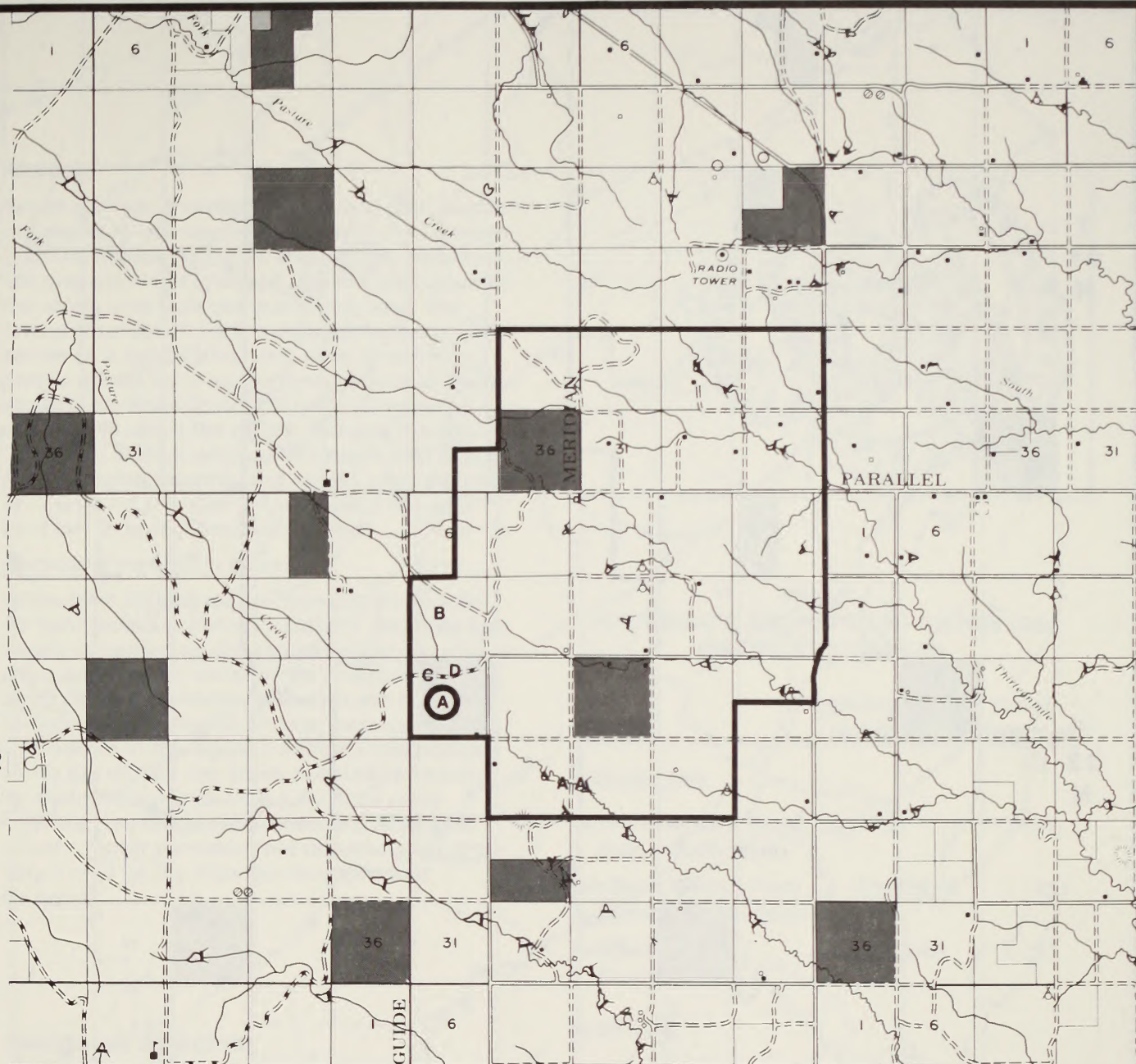
 BLM LAND  
 STATE LAND

FIGURE 11



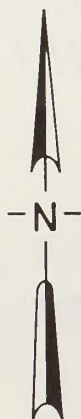
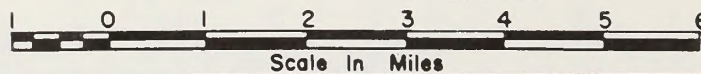


T  
21  
N

T  
22  
N

R52E

R53E



## RING-NECKED PHEASANT OBSERVATIONS

### LEGEND

- A Spring
- B Summer
- C Fall
- D Winter



-  BLM LAND
-  STATE LAND

FIGURE 12



## Raptors

Seven species of raptors were identified including one owl, one eagle, one harrier, two falcons and two hawks (Table 2). Raptor nest locations are presented in Figure 13. Raptor utilization of the study area was comparatively low. The Sheep Mountain Divide received the most utilization as a nesting/hunting area. One active prairie falcon aerie was observed west of the study area. Kestrels nested in cavities in the cliffs/bluffs along the divide and one inactive (probably abandoned) golden eagle nest was found. Eagles, falcons, and hawks often perched or flew along the divide and hunted the adjacent small-grain fields and uplands.

## Furbearers and Predators

Furbearers and predators normally harvested for their pelts are listed in Table 3. The only furbearer observed on the Bloomfield study area were muskrats in some of the reservoirs/drainages. Other furbearers present in the area but not observed probably should include mink and beaver in the aquatic habitats and bobcats along the divide. Predators normally harvested for their pelts and found on the area were coyotes, fox, long-tailed weasels and striped skunks. Other predators not observed but probably found on the area are raccoons and badgers.

## Nongame Species

### Amphibians and Reptiles

Although no amphibians were encountered on the Bloomfield study area, this area lies within the geographic range of several species, including the tiger salamander (*Ambystoma tigrinum*), plains spadefoot (*Scaphiopus bombifrons*), great plains toad (*Bufo cognatus*), woodhouse's toad, chorus frog, and leopard frog. It should be noted that amphibians and reptiles were recorded when they were observed but no special effort was made to determine their occurrence other than by casual observations.

Bull snakes, racers, and rattlesnakes were the only reptiles observed on the area (Table 1). Other reptiles such as short-horned toads (*Phrynosoma douglassi*), western hognose snakes (*Heterodon nasicus*) and plains garter snakes probably occur also, but were not encountered.

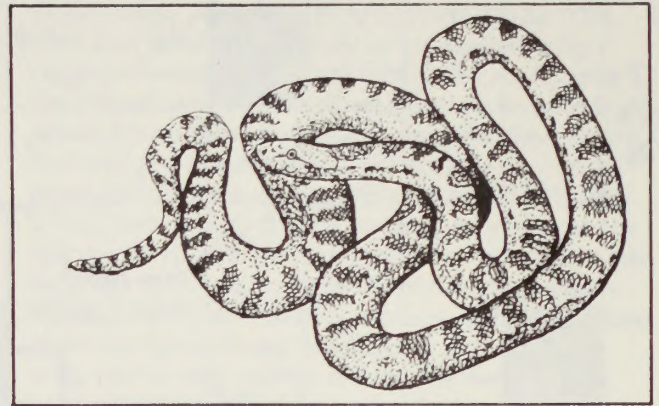


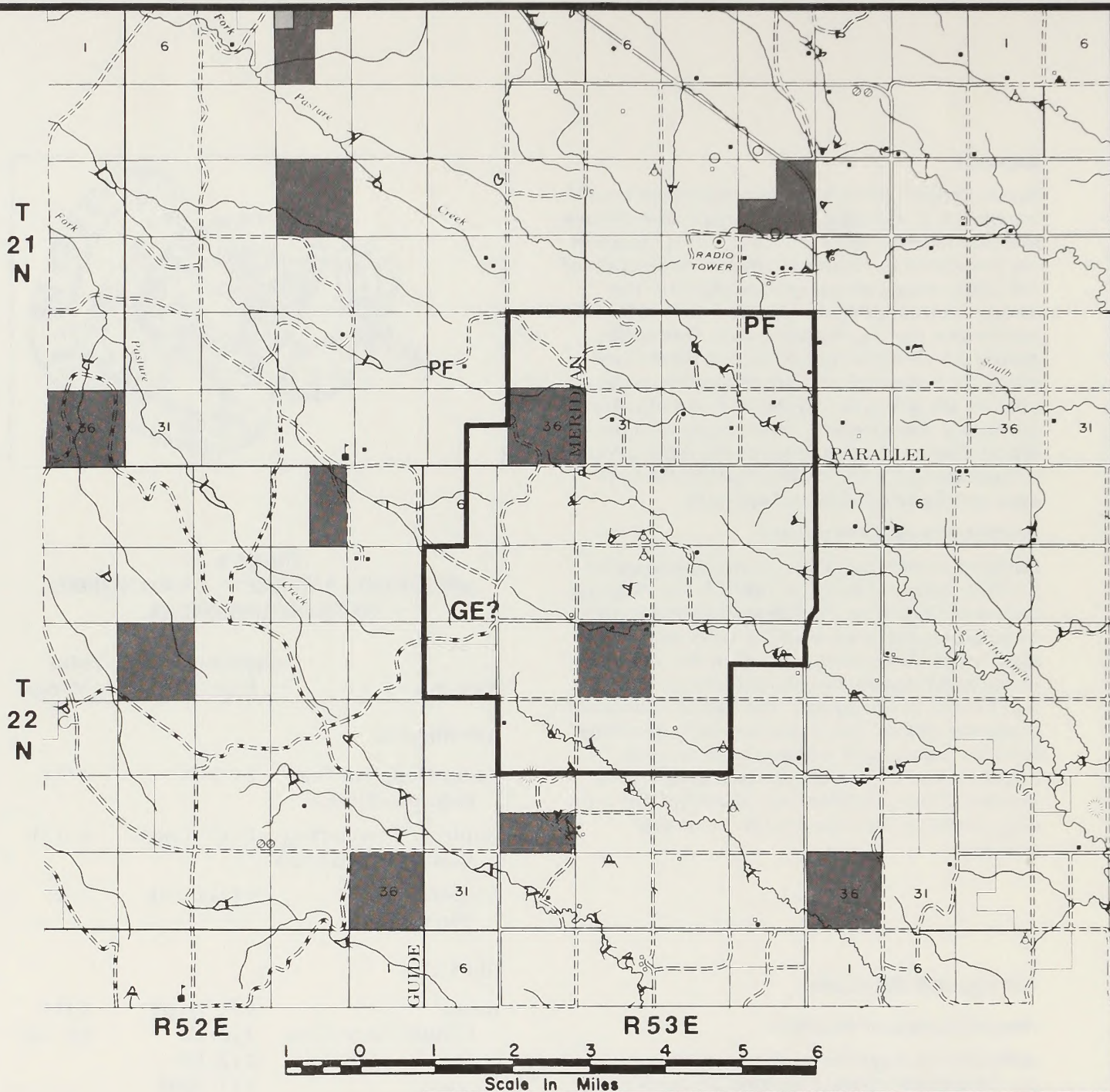
TABLE 1  
AMPHIBIANS AND REPTILES IDENTIFIED  
ON THE STUDY AREAS

Species	Sightings by Habitat	Total Sightings
AMPHIBIANS		
Rocky Mountain Toad <i>Bufo woodhousei</i>	1 (1) Gr	1 (1)
Northern Chorus Frog <i>Pseudacris triseriata</i>	1 (15) Creek	1 (15)
Leopard Frog <i>Rana pipiens</i>	1 (2) Creek	1 (2)
REPTILES		
Racer	1 (1) NIWF <sup>1</sup>	1 (1) <sup>1</sup>
Coluber constrictor	7 (8) Gr 2 (2) HD 1 (1) NIWF	10 (11)
Gopher (Bull) Snake <i>Pituophis melanoleucus</i>	1 (1) Gr <sup>1</sup> 2 (2) Gr 1 (1) NIWF	1 (1) <sup>1</sup> 3 (3)
Plains Garter Snake <i>Thamnophis radix</i>	1 (1) Gr	1 (1)
Western Rattlesnake <i>Crotalus viridis</i>	1 (1) NIWF <sup>1</sup> 2 (2) Gr	1 (1) <sup>1</sup> 2 (2)

<sup>1</sup>Bloomfield study area. (All other observations were made on North Fork study area.)

Legend: HD — Hardwood Draw  
Gr — Grassland  
NIWF — Agriculture





## RAPTOR NEST LOCATIONS

### LEGEND

PF *Prairie Falcon*  
 GE? *Possible Golden Eagle*

BLM LAND  
 STATE LAND

FIGURE 13



## Birds

This section discusses nongame birds such as the passerines. Game birds, waterfowl, and raptors were discussed previously. Fifty-two species of birds were identified on the Bloomfield study area. Specific data on their status, number of sightings, and habitat utilization is presented in Table 2.

Thirty-four species of birds were identified on the bird route (Appendix J). Western meadowlarks, horned larks, and mourning doves were the more abundant species on the route, in decreasing order of abundance. This was expected as the eastern three-fourths of the study area is agricultural land with very few woody draws or shelterbelts to attract woodland species. This lack of vegetation diversity directly affects the bird species diversity, resulting in fewer species and total numbers overall and a predominance of species such as meadowlarks and horned larks that prefer agricultural habitats.

The Savage Breeding Bird Survey Route (U.S. Fish and Wildlife Service) is located nearby (approximately 35 miles east). The route was first established in 1962 and has been run eight times since then, including the past four years. Recently, it has been run for comparison purposes to various energy-related studies in this area. Past results for the route are presented in Appendix K. For the most part, the Savage route extends through an area dominated by grasslands, creeks and woody draws. Although there is some agricultural land along the route, it only comprises a very minor portion of the route. Notable differences in bird species are the occurrence of shorebirds and waterfowl species and a well-developed woodland bird species composition along the Savage route versus an agricultural bird species composition on the Bloomfield route.

TABLE 2  
BIRDS IDENTIFIED ON THE BLOOMFIELD STUDY AREA

Species	Status <sup>1</sup>	Sightings by Habitat <sup>2</sup>	Total Sightings <sup>2</sup>
Mallard Anas platyrhynchos	w, B	5 (16) Creek 1 (40) Res	6 (56)
Red-tailed Hawk Buteo jamaicensis	w, B	1 (2) Gr 1 (1) HD	2 (3)
Ferruginous Hawk Buteo regalis	-, B	1 (1) NIWF	1 (1)
Golden Eagle Aquila chrysaetos	W, B <sup>3</sup>	3 (3) NIWF 2 (2) Badlands	5 (5)
Marsh Hawk Circus cyaneus	-, b	6 (6) NIWF 2 (2) Gr 1 (1) Creek 1 (1) HD	10 (10)
Prairie Falcon Falco mexicanus	W, B	2 (2) Gr 1 (1) Badlands 1 (1) HD 1 (1) NIWF	5 (5)
American Kestrel Falco sparverius	-, B	12 (16) NIWF 2 (2) Gr 1 (1) Badlands	15 (19)



**TABLE 2 (cont.)**  
**BIRDS IDENTIFIED ON THE BLOOMFIELD STUDY AREA**

<b>Species</b>	<b>Status<sup>1</sup></b>	<b>Sightings by Habitat<sup>2</sup></b>	<b>Total Sightings<sup>2</sup></b>
Sharp-tailed Grouse	W, B	6 (55) Gr 5 (19) NIWF 1 (1) Creek	12 (75)
Ring-necked Pheasant <i>Phasianus colchicus</i>	W, B	10 (24) HD 5 (5) Creek 3 (5) NIWF 1 (1) Badlands 1 (1) Gr 1 (1) Homesite	21 (37)
Killdeer <i>Charadrius vociferus</i>	-, B	3 (4) NIWF 1 (1) GR 1 (1) Creek	5 (6)
Ring-billed Gull <i>Larus delawarensis</i>	-, t	1 (1) NIWF	1 (1)
Mourning Dove <i>Zenaida macroura</i>	-, B	8 (12) NIWF 6 (22) Homesite 5 (11) HD 4 (28) Creek 4 (5) NIWF - HD 2 (3) Badlands 1 (5) NIWF - HD	30 (86)
Great-horned Owl <i>Bubo virginianus</i>	W, B	1 (1) Creek	1 (1)
Common Nighthawk <i>Chordeiles minor</i>	-, B	1 (1) NIWF	1 (1)
Common Flicker <i>Colaptes auratus</i>	-, B	1 (1) HD	1 (1)
Eastern Kingbird <i>Tyrannus tyrannus</i>	-, B	6 (8) Homesite 5 (5) NIWF 4 (11) HD 3 (5) Creek 1 (4) Gr	19 (33)
Western Kingbird <i>Tyrannus verticalis</i>	-, B	3 (4) Homesite 2 (2) NIWF 1 (1) HD	6 (7)
Say's Phoebe <i>Sayornis saya</i>	-, b	3 (3) NIWF 1 (1) Badlands	4 (4)



**TABLE 2 (cont.)  
BIRDS IDENTIFIED ON THE BLOOMFIELD STUDY AREA**

<b>Species</b>	<b>Status<sup>1</sup></b>	<b>Sightings by Habitat<sup>2</sup></b>	<b>Total Sightings<sup>2</sup></b>
Horned Lark <i>Eremophila alpestris</i>	W, B	79 (398) NIWF 4 (8) Gr	83 (406)
Barn Swallow <i>Hirundo rustica</i>	-, B	10 (17) Homesite 6 (23) NIWF 6 (21) Creek 3 (4) HD 1 (2) Gr	26 (67)
Black-billed Magpie <i>Pica pica</i>	W, B	7 (13) Badlands 6 (28) NIWF 3 (5) HD 1 (1) Gr	17 (47)
Common Crow <i>Corvus brachyrhynchos</i>	-, B	2 (4) HD 2 (3) NIWF	4 (7)
Black-capped Chickadee <i>Parus atricapillus</i>	W, b	1 (2) Badlands 1 (2) HD	2 (4)
House Wren <i>Troglodytes aedon</i>	-, b	7 (9) HD 4 (6) Homesite 1 (1) Creek	12 (16)
Rock Wren <i>Salpinctes obsoletus</i>	-, b	5 (6) Badlands	5 (6)
Gray Catbird <i>Dumetella carolinensis</i>	-, b	3 (5) HD 3 (3) Badlands	6 (8)
Brown Thrasher <i>Toxostoma rufum</i>	-, B	26 (32) HD 2 (2) Creek	28 (34)
American Robin <i>Turdus migratorius</i>	w, B	12 (26) Homesite 10 (52) HD 4 (5) Creek 2 (4) NIWF 1 (7) Gr 1 (1) Badlands	30 (95)
Mountain Bluebird <i>Sialia sialis</i>	-, b	1 (1) HD	1 (1)
Cedar Waxwing <i>Bombycilla cedrorum</i>	-, b	1 (1) HD	1 (1)
Northern Shrike <i>Lanius excubitor</i>	W, t	1 (1) HD 1 (1) Homesite 1 (1) Gr	3 (3)



**TABLE 2 (cont.)**  
**BIRDS IDENTIFIED ON THE BLOOMFIELD STUDY AREA**

<b>Species</b>	<b>Status<sup>1</sup></b>	<b>Sightings by Habitat<sup>2</sup></b>	<b>Total Sightings<sup>2</sup></b>
Loggerhead Shrike <i>Lanius ludovicianus</i>	-, B	3 (3) Gr 3 (3) NIWF 2 (2) Homesite 2 (2) HD	10 (10)
Starling <i>Sturnus vulgaris</i>	w, b	4 (37) Homesite 1 (2) NIWF	5 (39)
Yellow Warbler <i>Dendricua petechia</i>	-, b	15 (35) HD 5 (16) Homesite 5 (7) Creek	25 (58)
House Sparrow <i>Passer domesticus</i>	W, b	9 (48) Homesite	9 (48)
Bobolink <i>Dolichonyx oryzivorus</i>	-, b	2 (2) NIWF	2 (2)
Western Meadowlark <i>Sturnella neglecta</i>	-, B	64 (380) NIWF 14 (59) Gr 3 (18) NIWF - Gr 2 (10) Badlands - Gr 1 (2) Badlands	84 (469)
Red-winged Blackbird <i>Agelaius phoeniceus</i>	w, B	21 (47) NIWF 15 (79) Creek 3 (3) Homesite 1 (3) Gr	40 (132)
Northern Oriole <i>Oterus galbula</i>	-, b	2 (2) HD	2 (2)
Brewer's Blackbird <i>Euphaga cyanocephalus</i>	-, B	1 (2) Creek	1 (2)
Brown-headed Cowbird <i>Molothrus ater</i>	-, B	6 (12) Creek 5 (11) HD 4 (7) Homesite 5 (5) NIWF 1 (1) Gr	21 (36)
American Goldfinch <i>Carduelis tristis</i>	-, b	7 (23) HD 1 (1) Creek 1 (1) Homesite	9 (25)
Rufous-sided Towhee <i>Pipilo erythrophthalmus</i>	-, B	9 (10) HD 1 (2) Badlands	10 (12)



**TABLE 2 (cont.)**  
**BIRDS IDENTIFIED ON THE BLOOMFIELD STUDY AREA**

<b>Species</b>	<b>Status<sup>1</sup></b>	<b>Sightings by Habitat<sup>2</sup></b>	<b>Total Sightings<sup>2</sup></b>
Lark Bunting <i>Calamospiza melanocorys</i>	-, b	14 (58) NIWF 1 (2) Homesite 1 (1) Gr	16 (61)
Grasshopper Sparrow <i>Passerculus savannarum</i>	-, b	3 (3) Creek 2 (2) NIWF 1 (2) Gr	6 (7)
Vesper Sparrow <i>Poocetes gramineus</i>	-, b	13 (21) NIWF 6 (8) Gr 5 (6) Badlands	24 (35)
Lark Sparrow <i>Chondestes grammacus</i>	-, B	8 (21) HD 1 (1) Creek 1 (1) Gr	10 (23)
Dark-eyed Junco <i>Junco hyemalis</i>	-, t	1 (3) Creek	1 (3)
Tree Sparrow <i>Spizella arborea</i>	w, t	2 (5) Badlands 1 (5) Homesite 1 (2) HD	4 (12)
Chipping Sparrow <i>Spizella passerina</i>	-, B	1 (3) Creek 1 (2) HD	2 (5)
Lapland Longspur <i>Calcarius lapponicus</i>	W, t	1 (2) NIWF	1 (2)
Chestnut-collared Longspur <i>Calcarius ornatus</i>	-, B	3 (3) NIWF 1 (1) Gr	4 (4)

**Legend:**

<sup>1</sup>Based on Skaar's Montana Bird Distribution.

<sup>2</sup>Numbers are total number of sightings (total number of individuals sighted).

<sup>3</sup>Deviation from Skaar's classification made based on data in this report.

w — suspected wintering

W — known wintering

b — suspected breeding

B — known breeding

t — transient

HD — Hardwood Draw

Gr — Grassland

NIWF — Agriculture



## Mammals

Fifteen species of mammals were identified on the study area. These mammals, plus data on their relative abundance and habitat utilization, are listed in Table 3. Mule deer, white-tailed deer, antelope, and furbearers/predators were discussed in previous sections. This section discusses the remainder, i.e., rabbits, porcupines, and small rodents.

No attempts were made to capture bats in the study area. Matthews and Swenson (1982) provide a good comprehensive discussion of the bats found within this area. Most of the bats that they found probably occur or migrate through this area also.



White-tailed jackrabbits were relatively common. Although found throughout the area, they were more common along or near the divide. Cottontails were seen near the divide. Although no specimens were collected, they were believed to be desert cottontails based on the habitat, a badlands complex. Thompson (1978) found desert cottontails in similar habitat in his Circle West Study. Although no mountain cottontails (*Sylvilagus nuttalli*) were observed on the Bloomfield study area, they may occur in the woody draws.

Other non-game mammals were: porcupines in the woody draws and badlands complex, thirteen-lined ground squirrels throughout the area, and northern pocket gophers in the grasslands and barrow ditches. For a more complete listing of mammals that may occur in this area, see Matthews and Swenson (1981).

A total of 1,500 trap nights were completed during the study for small mammals sampling; however, this figure was corrected to 1,421 trap nights after snapped traps were subtracted from the total. There were 136 captures overall for a 9.57 capture/100 trap night efficiency (Table 4). Only three species of small mammals were captured. As expected, deer mice were the most abundant species, followed by western harvest mice and prairie voles. Because of the small sample size of captures, no attempt was made to calculate any diversity indices.

TABLE 3  
MAMMALS IDENTIFIED  
ON THE BLOOMFIELD STUDY AREA

Species	Sightings By Habitat <sup>1</sup>	Total Sightings <sup>1</sup>
White-tailed Jackrabbit <i>Lepus townsendi</i>	2 (2) NIWF 1 (1) Badlands	3 (3)
Desert Cottontail <i>Sylvilagus auduboni</i>	1 (1) Badlands	1 (1)
Porcupine <i>Erethizon dorsatum</i>	1 (1) HD	1 (1)
Northern Pocket Gopher <i>Thomomys talpoides</i>	(sign noted)	
Thirteen-lined Ground Squirrel <i>Spermophilus tridecemlineatus</i>	2 (2) NIWF 1 (1) Gr	3 (3)
Western Harvest Mouse <i>Reithrodontomys megalotis</i>	2 (2) Gr	2 (2)
Deer Mouse <i>Peromyscus maniculatus</i>	47 (47) Gr 33 (33) HD 33 (33) Creek 13 (13) Badlands 7 (7) NIWF	133 (133)
Muskrat <i>Ondatra zibethica</i>	(sign noted)	
Prairie Vole <i>Microtus ochrogaster</i>	1 (1) Badlands	1 (1)
Red Fox <i>Vulpes vulpes</i>	1 (1) HD	1 (1)
Coyote <i>Canis latrans</i>	1 (1) Badlands	1 (1)
Skunk <i>Mephitis mephitis</i>	1 (1) NIWF	1 (1)
Long-tailed Weasel <i>Mustela frenata</i>	1 (1) NIWF	1 (1)
Pronghorn <i>Antilocapra americana</i>	5 (17) NIWF	5 (17)
White-tailed Deer <i>Odocoileus virginianus</i>	26 (97) NIWF 16 (58) HD 13 (55) Creek 4 (14) Gr 2 (12) Badlands 2 (2) Homesite	62 (238)
Mule Deer <i>Odocoileus hemionus</i>	13 (58) Badlands 3 (8) NIWF 3 (7) Gr 1 (4) Homesite 1 (3) HD	21 (80)

<sup>1</sup>Numbers are total number of sightings (numbers of individuals sighted).

HD — Hardwood Draw  
Gr — Grassland  
NIWF — Agriculture



**TABLE 4**  
**RESULTS OF SMALL MAMMAL TRAPPING (BLOOMFIELD)**

	<b>Agriculture</b>	<b>Hardwood Draw</b>	<b>Creek</b>	<b>Grassland</b>	<b>Badlands</b>
Trap Nights	293	279	280	278	291
Total Captures	7	33	33	49	14
Captures/100 Trap Nights	2.4	11.8	11.8	17.6	4.8
Number of Species	1	1	1	2	2
<b>Species:</b>					
<i>Peromyscus maniculatus</i>	7	33	33	47	13
<i>Reithrodontomys megalotis</i>				2	
<i>Microtus ochrogaster</i>					1

## **NORTH FORK**

### **Game Species**

#### **Mule Deer**

Mule deer production and population characteristics are shown in Appendix G and harvest statistics are shown in Appendix H. Population structure was not determined because of the small sample size of observations during the fall period. Group size varied from 1-8 mule deer.

Mule deer distribution is shown in Figure 14. Observations were made in the upland breaks above the North Fork of Burns Creek and above the Middle Fork of Burns Creek. Most observations cluster along the latter for all seasons. Because of the unusually mild winter of 1980 - 81 in southeastern Montana, there were no winter concentrations of mule deer. Swenson (1980) mapped mule deer winter ranges for the severe winters of 1977-78 and 1978-79 (Figure 15). His data showed 2.9 deer/square mile in the area north of the North Fork of Burns Creek and 4.0 deer/square mile in the area south of the North Fork of Burns Creek. These figures reflect the total deer, i.e., mule deer and white-tailed deer, in the area. During a normal winter, these figures are probably much higher as deer often move from the woody draws and creek bottoms to the open areas in severe winters. (See explanation under white-tailed deer on the Bloomfield tract). Most mule deer observations were made in the upland breaks and rolling hills above the creek.

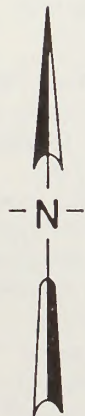
#### **White-tailed Deer**

White-tailed deer production and population characteristics are shown in Appendix G and harvest statistics are shown in Appendix H. Because of the low number of observations, the production figures may not be indicative of the white-tailed deer population in this area. Group size ranged from 1-6 white-tailed deer.

The white-tailed deer population in this area was not very high, although there are white-tailed deer along the complete length of North Fork of Burns Creek. White-tailed deer are much more abundant along the Middle Fork and South Fork of Burns Creek where there are more agricultural lands.

White-tailed deer distribution is shown in Figure 16. There were no winter concentrations because of the unusually mild winter. Except for a cluster in the northwest corner of the study area, most of the observations are scattered along the length of the North Fork of Burns Creek and in a woody draw to the south. Both areas have sufficient dense brush and cover to provide excellent white-tailed deer escape cover. The major item missing in this area necessary to provide excellent white-tailed deer habitat is agriculture. Although there is some agriculture land (mostly hay meadows and some small grains), the area lacks the extensive agricultural land, i.e., small-grains, corn, alfalfa, et cetera, that white-tailed deer prefer. This area is really better mule deer habitat.

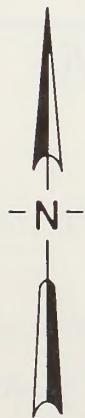
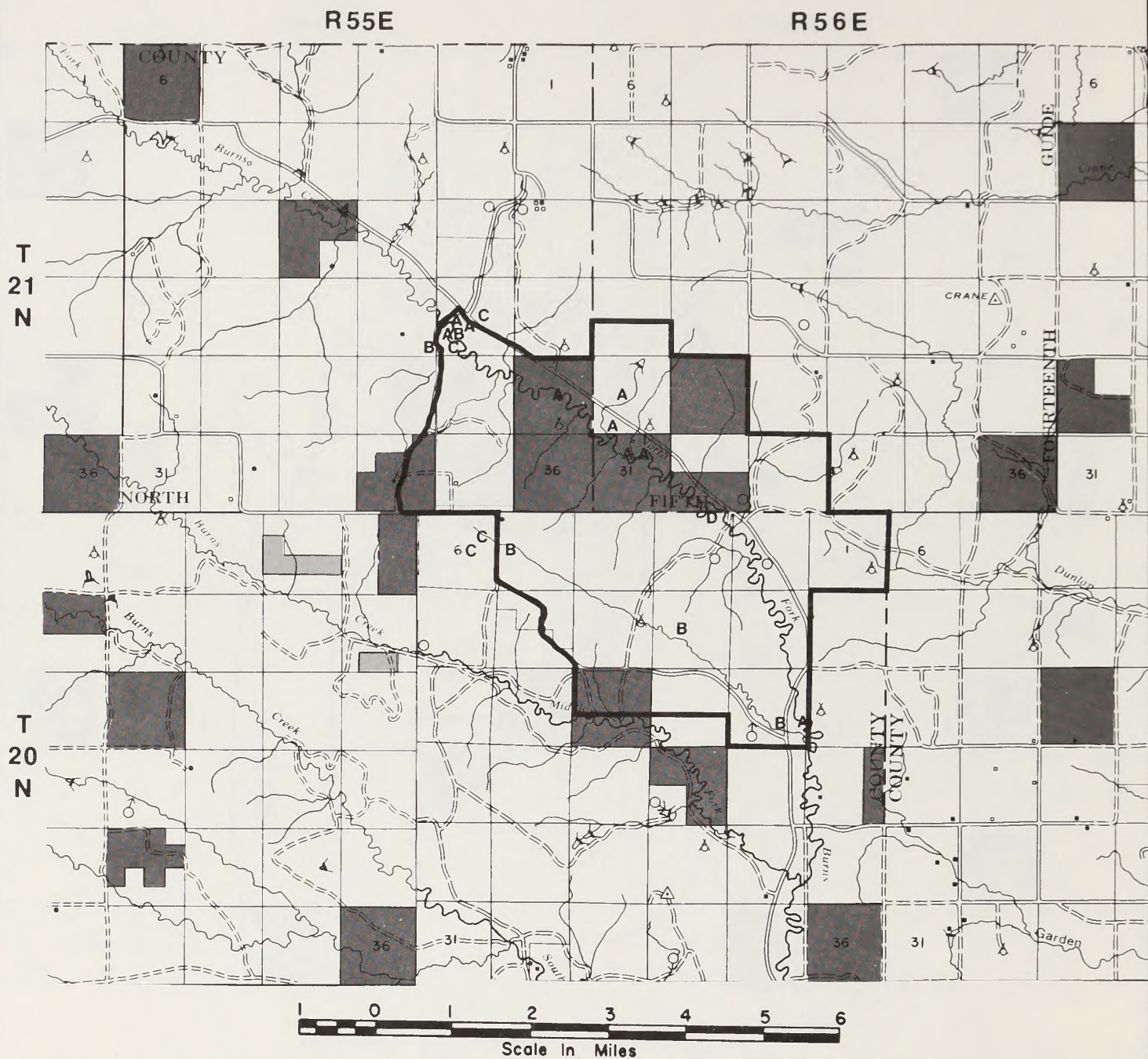












## WHITE-TAILED DEER OBSERVATIONS

### LEGEND

A Spring  
B Summer  
C Fall  
D Winter



 BLM LAND  
 STATE LAND

FIGURE 16



Swenson (1980) mapped the area north of the North Fork of Burns Creek as having 2.9 deer/square mile and the area south of there as having 4.0 deer/square mile (Figure 15). These figures were obtained during the severe winters of 1977-78 and 1978-79 and were derived from combining mule deer and white-tailed deer observations in the area.

### **Antelope**

Only three observations of antelope were made on the North Fork study area. All observations were made in spring and consisted of two observations of a single buck and one observation of three does. The spring-summer period is a time when antelope are at a maximum dispersal and it was concluded that this area is not antelope habitat. Wentland (1977) also showed no antelope in this area for summer distribution; however, one herd of approximately 20 antelope was noted on several occasions near T19N R56E Sec. 28 and 33, an area considerably south of the North Fork study area.

### **Sharp-tailed Grouse**

Locations of seven known and one possible sharp-tailed grouse arenas are shown in Figure 17. The majority of the arenas were along the creek. One "possible" arena was identified by a local rancher. Although sharp-tailed grouse were observed in this area on several occasions, the arena was not located. One spring observation was made of a group of males that probably had just left the arena and were displaying along the county road in this area. Other arenas probably exist in the study area but were not located. Therefore, population characteristic estimates are considered minimal.

Maximum counts of males attending these arenas are shown in Appendix I. Total male population for seven arenas was 90 and averaged 12.9 males/arena. This is well above the 10 males/arena average for Region 7 in 1981 as reported by Knapp, et al., 1981; however, it is a drop from the 16 males/arena average in 1980 for Region 7 (Knapp and Swenson 1980). Depending upon the technique used to estimate the sharp-tailed grouse population, the estimates range from 180 sharp-tailed grouse (Robel's et al. 1972 technique) to 360 sharp-tailed grouse (Rippin and Boag's 1974 technique). This averages out to 8.6 to 17.2 sharp-tailed grouse/square mile.

Four broods were observed (broods of five, eleven, twelve, and fourteen) which averaged

10.5 young /brood. This is extremely high when compared to the Region 7 average of 1.7 young/brood in 1980 (Knapp et al. 1981) and the 4.2 young/brood average in 1979 (Knapp and Swenson 1980).

Distribution of sharp-tailed grouse is shown in Figures 18 and 19. Most observations occurred along the North Fork of Burns Creek and the woody draw south of there. Habitat utilization showed grasslands, creeks, woody draws, and small-grain fields to be the most important habitats. This is biased somewhat in that most arenas are located in grasslands and most spring observations were made at or near the arena. Woody draws and creeks were used as cover with some movement to small grain fields for feeding.

### **Ring-necked Pheasant**

Ring-necked pheasants were relatively common on the study area and their distribution is shown in Figure 20. Like white-tailed deer, portions of the study area lacked the extensive agriculture lands that they prefer. Consequently, the observations cluster somewhat in the areas where there are some small grains nearby, e.g., the junction of the North Fork Burns Creek and the woody draw south of there, the northwestern portion of the study area, and similar areas with adjacent small-grain fields. There were many scattered observation noted during the spring season when males are establishing territories.

Only one brood of four was observed. This was well below the 9.0 young/brood reported for Region 7 (Knapp et al. 1981), but the observation was made in August when the birds were several months old and compares favorably with a brood of five observed at the same time on the Bloomfield tract.

Habitat utilization showed the creek, woody draws, and small-grain fields are the most important use areas. For the most part, the creek and woody draws were used for nesting and cover and the small-grain fields were used for feeding.

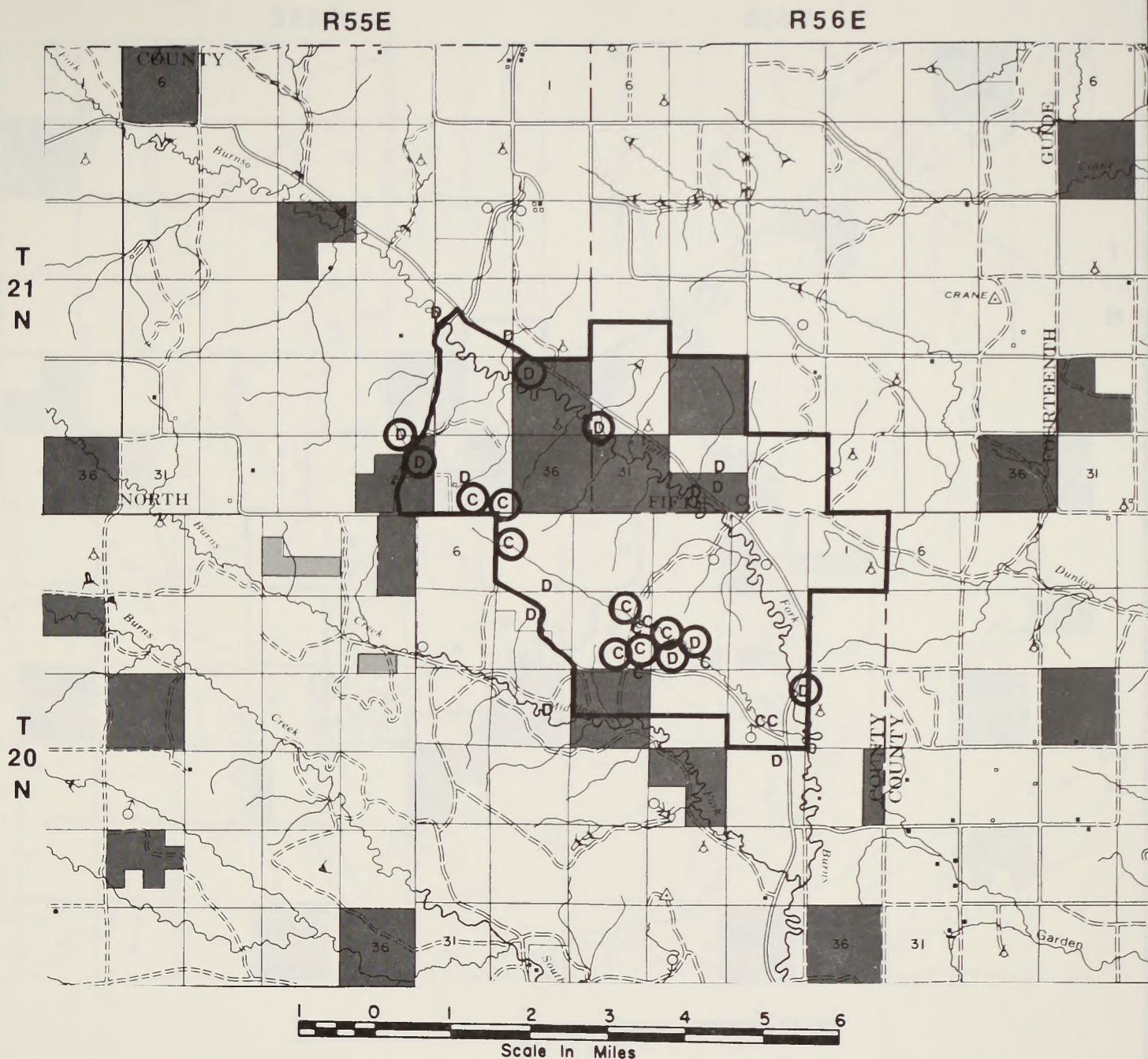
### **Gray Partridge**

Trueblood and Weigand (1971) found the gray partridge most abundant in the northeastern and northcentral counties of Montana. They prefer those areas with a mixture of cultivated (small-grain fields) and non-cultivated lands. As mentioned previously, the North Fork study area lacks the extensive small-grain fields that gray partridge thrive in. One observation of a









## SHARP-TAILED GROUSE OBSERVATIONS FOR FALL—WINTER

### LEGEND

- C Fall
- D Winter
- O (Circled Letter)
- Group of Ten or More



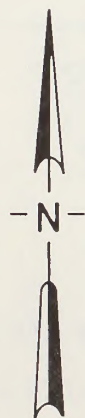
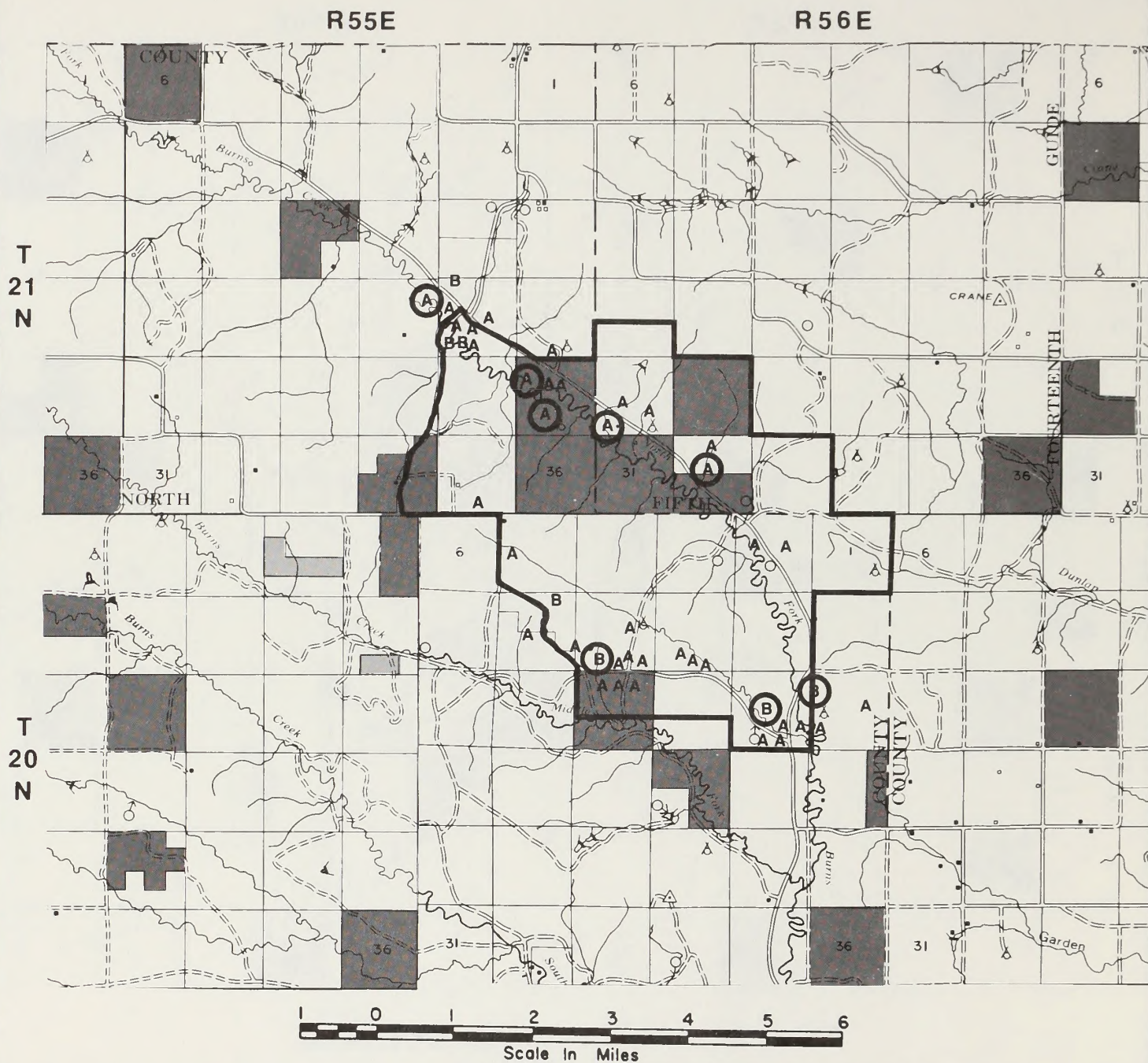
-  BLM LAND
-  STATE LAND

FIGURE 18





## SHARP-TAILED GROUSE OBSERVATIONS FOR SPRING—SUMMER

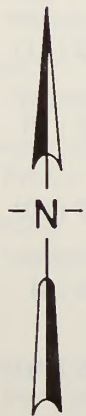
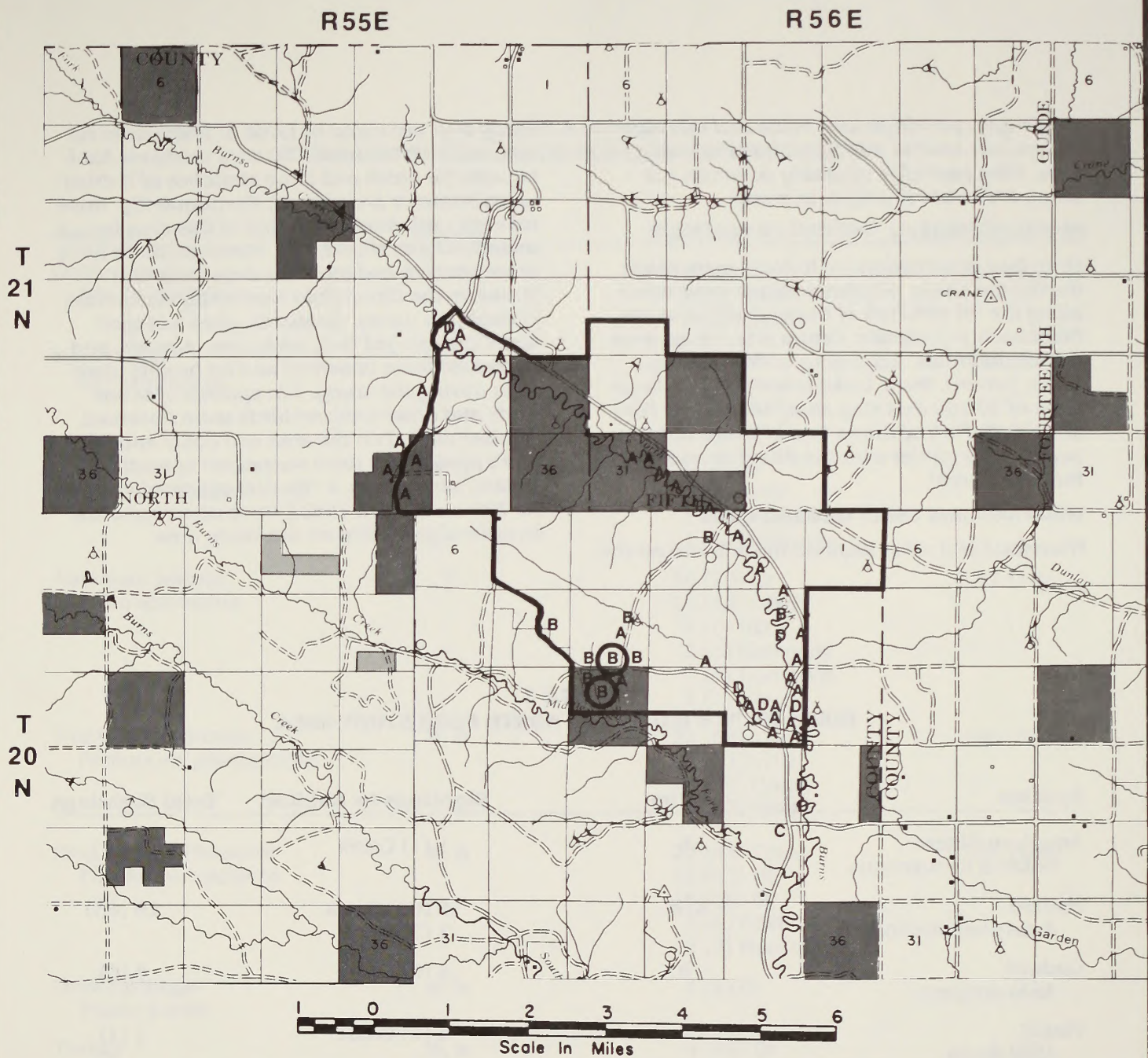
### LEGEND

- A Spring
- B Summer
- O (Circled Letter)  
Group of Ten or More

- BLM LAND
- STATE LAND

FIGURE 19







## RING-NECKED PHEASANT OBSERVATIONS

### LEGEND

- A Spring
- B Summer
- C Fall
- D Winter

-  BLM LAND
-  STATE LAND

- O (Circled Letter)  
Group of Ten or More

FIGURE 20



single gray partridge was made and this observation was several miles south of the study area. Gray partridge probably occur on the study area but utilization is minor.

#### **Merriam's Turkey**

Only four observations of turkeys were made during the study. All observations were made along the Middle Fork of Burns Creek near the Blankenship homesite. Group size varied from 4-26 individuals. According to Blankenship (pers. comm), these turkeys are part of a large flock of 50-100 that stay along the Middle Fork and South Fork of Burns Creek. These turkeys supposedly winter near the Allard homesite (off the study area).

#### **Waterfowl and Other Wetland Birds**

Waterfowl and other wetland birds found on the

study area are listed in Table 5. There were no reservoirs on the area. The only wetlands habitat was the creek and large stretches of it dried up as summer progressed. Consequently, there was only minimal utilization of this area by waterfowl and shorebirds, however, there were more species and total numbers than was found on the Bloomfield tract. Only six species of dabbling ducks, (mallards, green-winged teal, blue-winged teal, widgeons, pintails, and gadwalls) were observed and no broods were seen during the study. Ten species of shorebirds and other wetland birds were observed. Killdeer nested on the area and coots and Wilson's phalaropes were suspected of nesting. Upland sandpipers, a "special concern" species for Montana (Flath 1981), were observed once in upland grassland on the study area.

**TABLE 5**  
**BIRDS IDENTIFIED ON THE NORTH FORK STUDY AREA**

<b>Species</b>	<b>Status</b>	<b>Sightings by Habitat<sup>1</sup></b>	<b>Total Sightings</b>
American Bittern <i>Botarus lentiginosus</i>	-, b	1 (1) Creek	1 (1)
Mallard <i>Anas platyrhynchos</i>	w, B	15 (61) Creek 1 (2) HD	16 (63)
Gadwall <i>Anas strepera</i>	-, b	4 (6) Creek	4 (6)
Pintail <i>Anas acuta</i>	-, B	1 (1) Creek	1 (1)
Green-winged Teal <i>Anas crecca</i>	-, t	2 (11) Creek	2 (11)
Blue-winged Teal <i>Anas discors</i>	-, B	5 (7) Creek	5 (7)
American Wigeon <i>Anas americana</i>	-, b	7 (10) Creek	7 (10)
Turkey Vulture <i>Cathartes aura</i>	-, b	1 (1) Creek 4 (7) Gr	5 (8)
Red-tailed Hawk <i>Buteo jamaicensis</i>	w, B	12 (12) Gr 1 (2) HD	13 (14)
Rough-legged Hawk <i>Buteo lazopus</i>	W <sup>3</sup> ,t	1 (1) Creek 2 (2) HD	3 (3)
Ferruginous Hawk <i>Buteo regalis</i>	-, B <sup>3</sup>	1 (1) Gr	1 (1)



**TABLE 5 (cont.)**  
**BIRDS IDENTIFIED ON THE NORTH FORK STUDY AREA**

<b>Species</b>	<b>Status</b>	<b>Sightings by Habitat<sup>1</sup></b>	<b>Total Sightings</b>
Golden Eagle <i>Aquila chrysaetos</i>	W, B	10 (10) Gr 3 (3) NIWF 2 (3) Creek	15 (16)
Marsh Hawk <i>Circus cyaneus</i>	W, b	18 (19) Gr 7 (7) Creek 5 (6) NIWF 2 (3) HD	32 (35)
Prairie Falcon <i>Falco mexicanus</i>	W, B	6 (6) Gr 2 (2) NIWF 1 (1) Creek 1 (1) Badlands	10 (10)
American Kestrel <i>Falco sparverius</i>	-, B	16 (19) Gr 13 (14) NIWF 4 (6) HD 2 (3) Badlands 1 (3) Homesite 1 (1) Creek	37 (46)
Sharp-tailed Grouse <i>Pediacetes phasianellus</i>	W, B	72 (586) Gr 18 (117) HD 10 (29) Creek 9 (67) NIWF	109 (799)
Ring-necked Pheasant <i>Phasianus colchicus</i>	W, B	27 (42) Creek 19 (42) HD 15 (50) Gr 2 (4) NIWF 2 (2) Homesite	65 (140)
Gray Partridge <i>Perdix perdix</i>	W, b	1 (1) Gr	1 (1)
Turkey <i>Meleagris gallopavo</i>	W, b	4 (49) Gr	4 (49)
Sora <i>Porzana carolina</i>	-, b	1 (1) Creek	1 (1)
American Coot <i>Fulica americana</i>	-, b	8 (9) Creek	8 (9)
Killdeer <i>Charadrius vociferus</i>	-, B	20 (29) Gr 13 (21) Creek 4 (5) HD 1 (1) NIWF	38 (56)
Upland Sandpiper <i>Bartramia longicauda</i>	-, b	1 (2) Gr	1 (2)
Spotted Sandpiper <i>Actitis macularia</i>	-, b	1 (1) Creek	1 (1)
Solitary Sandpiper <i>Tringa solitaria</i>	-, t	1 (4) Creek	1 (1)



**TABLE 5 (cont.)**  
**BIRDS IDENTIFIED ON THE NORTH FORK STUDY AREA**

<b>Species</b>	<b>Status</b>	<b>Sightings by Habitat<sup>1</sup></b>	<b>Total Sightings</b>
Willet <i>Catoptrophorus semipalmatus</i>	-, b	1 (1) Creek	1 (1)
Wilson's Phalarope <i>Steganopus tricolor</i>	-, b	4 (12) Creek	4 (12)
Rock Dove <i>Columba livia</i>	W, b	1 (4) Gr 1 (1) Creek	2 (5)
Mourning Dove <i>Zenaida macroura</i>	-, B	19 (56) HD 9 (25) Creek 9 (25) Gr 8 (37) NIWF 2 (10) HD - Gr 1 (4) NIWF - Gr	48 (157)
Common Nighthawk <i>Chordeiles minor</i>	-, B	4 (4) Gr 3 (3) Creek 1 (1) HD 1 (1) NIWF 1 (1) Badlands	10 (10)
Belted Kingfisher <i>Megasceryle alcyon</i>	-, b	1 (1) Creek	1 (1)
Common Flicker <i>Colaptes auratus</i>	-, B	13 (21) HD 3 (4) Gr	16 (25)
Eastern Kingbird <i>Tyrannus tyrannus</i>	-, B	22 (29) HD 16 (18) Gr 13 (18) Creek 3 (4) Homesite	54 (69)
Western Kingbird <i>Tyrannus verticalis</i>	-, B	8 (12) Gr 3 (4) NIWF	11 (16)
Say's Phoebe <i>Sayornis saya</i>	-, b	1 (2) Creek 1 (2) HD	2 (4)
Horned Lark <i>Eremophila alpestris</i>	W, B	20 (67) NIWF 18 (78) Gr	38 (145)
Bank Swallow <i>Riparia riparia</i>	-, B	1 (2) Creek	1 (2)
Rough-winged Swallow <i>Stelgidopteryx ruficollis</i>	-, b	6 (8) Creek 1 (1) HD	7 (9)
Barn Swallow <i>Hirundo rustica</i>	-, B	37 (59) HD 28 (59) Creek 6 (17) Homesite 4 (21) Gr 4 (7) NIWF	79 (163)
Cliff Swallow <i>Petrochelidon phrrhonota</i>	-, B	1 (4) HD	1 (4)



**TABLE 5 (cont.)**  
**BIRDS IDENTIFIED ON THE NORTH FORK STUDY AREA**

<b>Species</b>	<b>Status</b>	<b>Sightings by Habitat<sup>1</sup></b>	<b>Total Sightings</b>
Black-billed Magpie <i>Pica pica</i>	W, B	34 (55) HD 10 (12) Gr 8 (10) Creek 3 (3) NIWF	55 (80)
Common Crow <i>Corvus brachyrhynchos</i>	-, B	11 (86) NIWF 14 (26) Gr 8 (25) HD 1 (2) Creek	34 (139)
Black-capped Chickadee <i>Parus atricapillus</i>	W, b	2 (6) HD 1 (1) Homesite	3 (7)
House Wren <i>Troglodytes aedon</i>	-, b	11 (12) HD 2 (3) Gr 1 (1) Creek	14 (16)
Rock Wren <i>Salpinctes obsoletus</i>	-, b	2 (3) Badlands	2 (3)
Gray Catbird <i>Dumetella carolinensis</i>	-, b	4 (4) HD	4 (4)
Brown Thrasher <i>Toxostoma rufum</i>	-, B	8 (9) HD 1 (1) Creek 1 (1) Badlands	10 (11)
American Robin <i>Turdus migratorius</i>	W, B	34 (122) HD 6 (27) Creek 1 (1) Homesite 1 (1) NIWF	41 (151)
Mountain Bluebird <i>Sialia sialis</i>	-, b	10 (13) HD 8 (19) Gr 2 (2) NIWF 1 (1) Badlands	21 (35)
Northern Shrike <i>Lanius excubitor</i>	W, t	3 (3) HD 2 (2) Gr	5 (5)
Loggerhead Shrike <i>Lanius ludovicianus</i>	-, B	28 (36) HD 20 (31) Gr 5 (5) Creek 3 (4) NIWF	56 (76)
Starling <i>Sturnus vulgaris</i>	w, b	5 (9) Gr 3 (20) Homesite 2 (4) NIWF 2 (3) HD	12 (36)
Yellow Warbler <i>Denroica petechia</i>	-, b	23 (36) HD 4 (7) Creek	27 (43)
Common Yellowthroat <i>Geothlypis trichas</i>	-, b	1 (1) HD	1 (1)



**TABLE 5 (cont.)**  
**BIRDS IDENTIFIED ON THE NORTH FORK STUDY AREA**

<b>Species</b>	<b>Status</b>	<b>Sightings by Habitat<sup>1</sup></b>	<b>Total Sightings</b>
House Sparrow <i>Passer domesticus</i>	W, b	4 (22) Homesite 1 (1) HD	5 (23)
Western Meadowlark <i>Sturnella neglecta</i>	-, B	58 (327) Gr 14 (82) NIWF 8 (67) NIWF - Gr 1 (8) Creek	81 (484)
Yellow-headed Blackbird <i>Xanthocephalus xanthocephalus</i>	-, b	1 (3) Creek 1 (1) HD	2 (4)
Red-winged Blackbird <i>Agelaius phoeniceus</i>	w, B	25 (97) Creek 11 (21) HD 2 (3) NIWF	38 (121)
Northern Oriole <i>Icterus galbula</i>	-, b	5 (6) HD 2 (3) Creek	7 (9)
Brewer's Blackbird <i>Euphaga cyanocephalus</i>	-, B	6 (8) Creek 4 (8) HD	10 (16)
Brown-headed Cowbird <i>Molothrus ater</i>	-, B	10 (22) HD 6 (14) Gr 4 (18) Creek 3 (17) NIWF	23 (71)
Lazuli Bunting <i>Passerina amoena</i>	-, b	1 (1) HD	1 (1)
Common Redpoll <i>Carduelis flammea</i>	W, t	10 (147) Gr 9 (139) HD	19 (286)
American Goldfinch <i>Carduelis tristis</i>	-, b	24 (45) HD 3 (4) Gr 2 (5) NIWF 1 (1) Creek	30 (55)
Rufous-sided Towhee <i>Pipis erythrophthalmus</i>	-, B	25 (28) HD 2 (2) Creek	27 (30)
Lark Bunting <i>Calamospiza melanocorys</i>	-, b	5 (22) NIWF 1 (2) Gr	6 (24)
Grasshopper Sparrow <i>Passerculus savannarum</i>	-, b	2 (2) Gr	2 (2)
Vesper Sparrow <i>Poocetes gramineus</i>	-, b	20 (70) Gr 3 (9) NIWF	23 (79)
Lark Sparrow <i>Chondestes grammacus</i>	-, B	43 (96) HD 5 (11) Gr 3 (10) NIWF 3 (4) Creek	54 (121)
Dark-eyed Junco <i>Junco hyemalis</i>	-, t	1 (1) HD	1 (1)



**TABLE 5 (cont.)  
BIRDS IDENTIFIED ON THE NORTH FORK STUDY AREA**

<b>Species</b>	<b>Status</b>	<b>Sightings by Habitat<sup>1</sup></b>	<b>Total Sightings</b>
Tree Sparrow Spizella arborea	w, t	22 (88) HD 4 (10) Creek 1 (3) Homesite	27 (101)
Chipping Sparrow Spizella passerina	-, B	18 (53) HD 4 (20) NIWF 3 (7) Creek	25 (80)
Field Sparrow Spizella pusilla	-, B	4 (12) Gr	4 (12)
Lapland Longspur Calcarius lapponicus	W, t	1 (2) Gr	1 (2)
Chestnut-collared Longspur Calcarius ornatus	-, B	1 (1) Gr	1 (1)
Snow Bunting Plectrophenax nivalis	W, t	1 (4) Gr 1 (3) NIWF	2 (7)

**Legend:**

<sup>1</sup>Based on Skaar's Montana Bird Distribution

<sup>2</sup>Numbers are total number of sightings (total number of individuals sighted).

<sup>3</sup>Deviation from Skaar's classification made based on data in this report.

w — suspected wintering

W — known wintering

b — suspected breeding

B — known breeding

t — transient

HD — Hardwood Draw

Gr — Grassland

NIWF — Agriculture

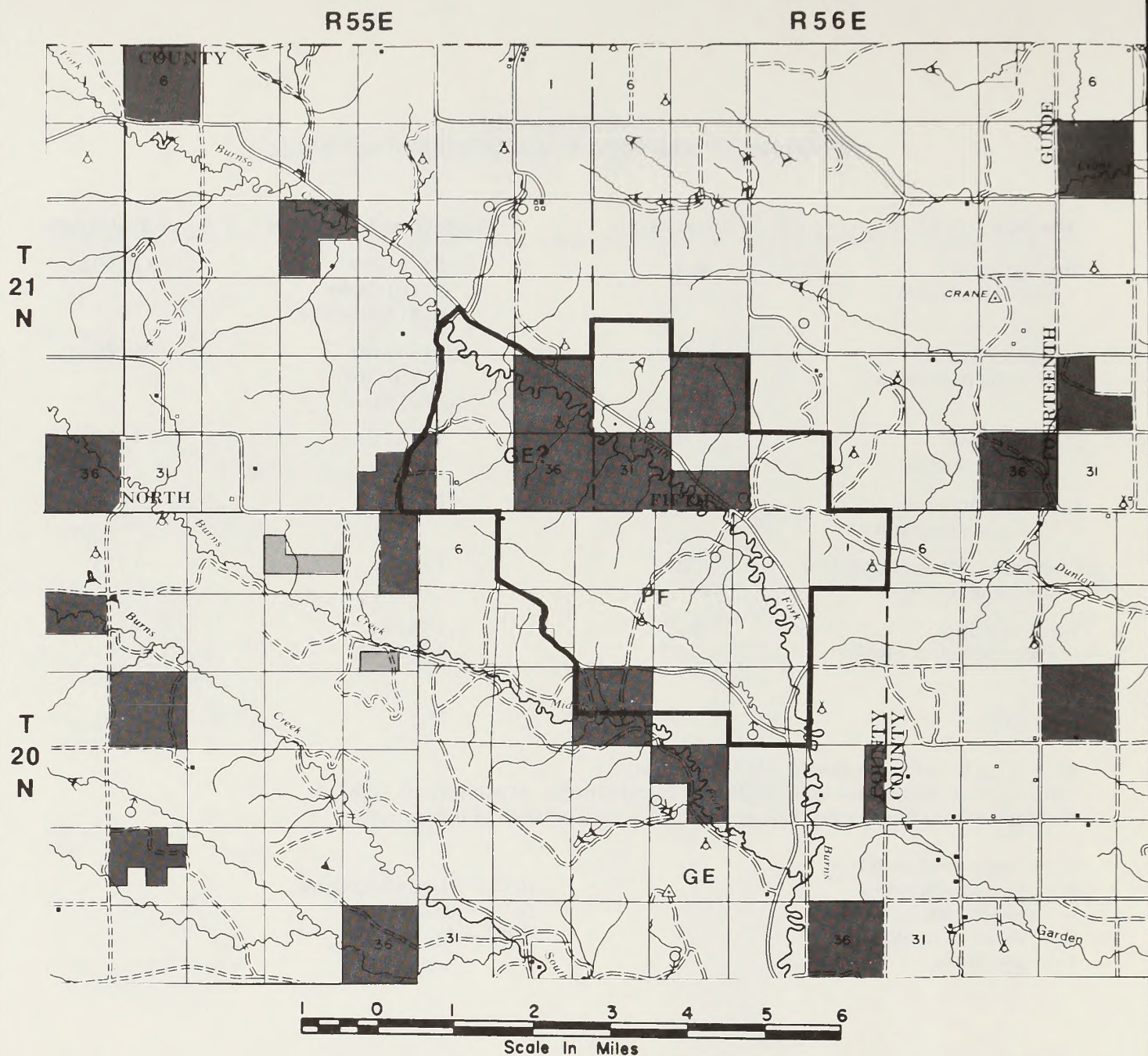
**Raptors**

*Eight species of raptors were identified which included one eagle, one harrier, two falcons, three hawks, and one vulture (Table 5). Raptor nest locations, except kestrels, are presented in Figure 21. One prairie falcon aerie was located; one active golden eagle nest was located; and one "possible" golden eagle nest in a cave that was inactive this past year but is occasionally used by golden eagles (Cayer, pers. comm.) was located. Raptors utilized the badlands complex for nesting and perching and hunted the creek, grasslands, and grain fields.*

**Furbearers and Predators**

*Furbearers and predators normally harvested for their pelts are listed in Table 6. Muskrats were the only furbearer observed; however, beaver are found below the study area on Burns Creek and probably use the North Fork as well. Mink probably occur in the creek and bobcats probably occur in the hills and "breaks". The only predators seen on the area were coyotes, raccoons, and striped skunks, although weasels, fox, and badgers probably occur there.*





## RAPTOR NEST LOCATIONS

### LEGEND

PF     Prairie Falcon  
 GE     Golden Eagle  
 GE?   Possible Golden Eagle

BLM LAND  
 STATE LAND

FIGURE 21



**TABLE 6**  
**MAMMALS IDENTIFIED**  
**ON THE NORTH FORK STUDY AREA**

Species	Sightings By Habitat <sup>1</sup>	Total Sightings <sup>1</sup>
White-tailed Jackrabbit <i>Lepus townsendi</i>	10 (13) Gr 2 (2) NIWF 2 (2) Creek	14 (17)
Desert Cottontail* <i>Sylvilagus auduboni</i>	2 (2) Creek 8 (9) HD 8 (9) Gr	18 (20)
Mountain Cottontail* <i>Sylvilagus nuttalli</i>		
Porcupine <i>Erethizon dorsatum</i>	2 (2) Creek 2 (2) HD 2 (2) Gr 1 (1) NIWF	7 (7)
Beaver <i>Castor canadensis</i>	(sign noted)	
Northern Pocket Gopher <i>Thomomys talpoides</i>	(sign noted)	
Thirteen-lined Ground Squirrel <i>Spermophilus tridecemlineatus</i>	3 (3) NIWF	3 (3)
Northern Grasshopper Mouse <i>Onychomys leucogaster</i>	3 (3) NIWF	3 (3)
Deer Mouse <i>Peromyscus maniculatus</i>	25 (25) NIWF 13 (13) HD 13 (13) Creek 13 (13) Badlands 10 (10) Gr	74 (74)
Muskrat <i>Ondatra zibethica</i>	(sign noted)	
Prairie Vole <i>Microtus ochrogaster</i>	1 (1) NIWF	1 (1)
Meadow Vole <i>Microtus ochrogaster</i>	4 (4) Creek	4 (4)
Raccoon <i>Procyon lotor</i>	1 (5) HD	1 (5)
Coyote <i>Canis latrans</i>	1 (1) Creek 2 (3) Gr	3 (4)
Striped Skunk <i>Mephitis mephitis</i>	1 (1) HD	1 (1)
Pronghorn <i>Antilocapra americana</i>	3 (5) Gr	3 (5)
White-tailed Deer <i>Odocoileus virginianus</i>	10 (32) Creek 7 (28) NIWF 7 (14) HD 1 (1) Gr	25 (75)
Mule Deer <i>Odocoileus hemionus</i>	11 (45) Gr 7 (14) HD 3 (7) Badlands 1 (6) Creek 1 (5) NIWF	23 (77)

\*Combined sightings for desert and mountain cottontail; cannot differentiate in the field.

<sup>1</sup>Numbers are total numbers of sightings (total numbers of individuals sighted).

HD — Hardwood Draw Gr — Grassland NIWF — Agriculture

## Nongame Species

### Amphibians and Reptiles

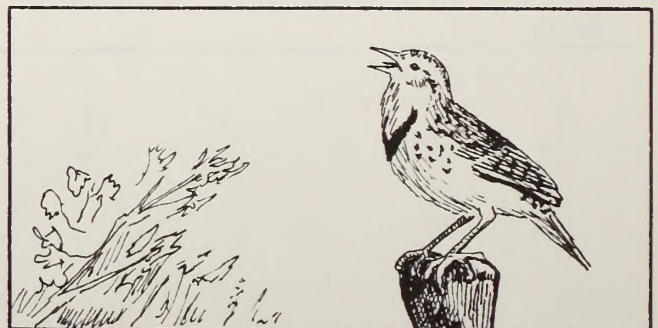
Amphibians observed on the North Fork study area include: Woodhouse's toad, chorus frog, and leopard frog (Table 1). Others, undoubtedly found there but not observed, should include: tiger salamander, plains spadefoot, and great plains toad.

Bull snakes, plains garter snakes, racers, and prairie rattlesnakes were reptiles observed on the study area (Table 1). Short-horned toads and western hognose snakes probably occur there but were not seen.

### Birds

Since game birds, waterfowl, and raptors were discussed previously, this section concentrates mostly on non-game birds such as the passerines. Seventy-six species of birds were identified on the area. Specific data on their status, number of sightings, and habitat utilization is presented in Table 5.

Forty-six species of birds were observed on the bird route (Appendix L). Western meadowlarks, mourning doves, killdeer, barn swallows, eastern kingbirds, and yellow warblers were the more common species on the route in decreasing order of abundance. The North Fork tract is more of a native grassland area interspersed with woody draws, a badlands complex (Sheep Mountain Divide), and the North Fork of Burns Creek. Consequently, woodland species of birds such as brown thrashers, house wrens, and northern orioles are more predominant in this area than the Bloomfield study area. Because of the greater vegetation diversity, there is greater bird species diversity, particularly evident in woodland birds. When the route data is compared to the past results of the Savage Breeding Bird Route (Appendix K), bird species composition is quite comparable. This was expected as the routes are only 20-25 miles apart and both routes have similar habitats in approximately the same proportions.





## Mammals

Seventeen species of mammals were identified on the study area. These mammals, plus data on their relative abundance and habitat utilization, is presented in Table 6. As mule deer, white-tailed deer, antelope, and fur-bearers/predators were discussed in previous sections, this section discusses the remainder (rabbits, small rodents, et cetera).

No bats were captured during the study. See Matthews and Swenson (1982) for a comprehensive discussion of bats which occur in this area.

White-tailed jackrabbits were relatively common throughout the area. Cottontails were common to abundant in the woody draws, creek bottoms, and rocky outcrops. Two species of cottontails were identified. Three road-killed cottontails were found on the area. One found near a woody draw was a mountain cottontail and two found in upland grassland around rocky outcrops were desert cottontails.

This agrees with the habitat preferences of the two species as discussed by Matthews and Swenson (1982).

Other non-game mammals include: porcupine in the woody draws and creek bottoms, thirteen-lined ground squirrels in the upland areas, and northern pocket gophers in the uplands and barrow ditches. See Matthews and Swenson (1982) for a more complete listing of mammals that may occur in the area.

Fifteen-hundred trap nights of small mammal sampling were completed during the study. After correcting for empty but sprung traps, there were 1,458 trap nights. There were 103 captures overall for a 7.06 capture/100 trap night efficiency (Table 7). Four species of small mammals were captured with deer mice being the most abundant species followed by meadow voles, northern grasshopper mice, and prairie voles in decreasing order of abundance. Diversity indices were not calculated because of the small sample size.

TABLE 7  
RESULTS OF SMALL MAMMAL TRAPPING (NORTH FORK)

	Agriculture	Hardwood Draw	Creek	Grassland	Badlands
Trap Nights	296	287	295	291	289
Total Captures	29	13	17	11	13
Captures/100 Trap Nights	9.8	14.5	15.8	13.8	4.5
Number of Species	3	1	2	2	1
<b>Species:</b>					
Peromyscus maniculatus	25	13	13	10	13
Onychomys leucogaster	3				
Microtus ochrogaster	1				
Microtus pennsylvanicus			4		
Birds				1	



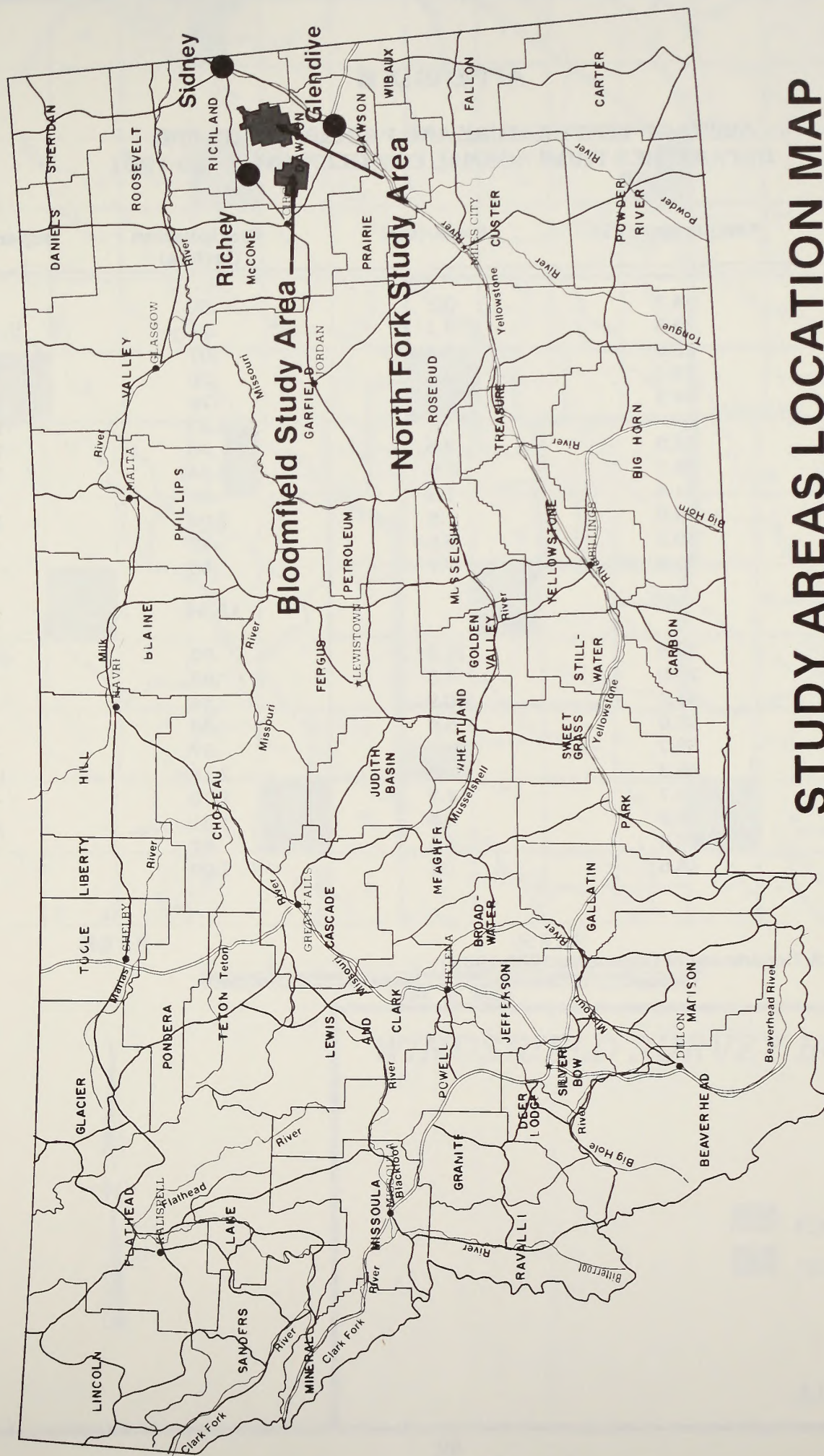
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# STUDY AREAS LOCATION MAP



## APPENDIX B

### AVERAGE TEMPERATURE AND PRECIPITATION AND DEPARTURES FROM NORMAL FOR GLENDIVE 1980-1981

Month	Temperature (°F)	Departure	Precipitation (inches)	Departure
Jan 1980	14.7	-0.2	.59	.16
Feb	24.6	4.1	.21	-.17
Mar	32.8	2.4	.07	-.46
Apr	53.7	7.3	.16	-1.10
May	64.2	6.4	.20	-1.64
Jun	—	—	2.27	-1.20
Jul	76.8	2.8	.76	-1.12
Aug	68.7	-3.5	5.54	3.91
Sep	61.4	1.2	.70	-.35
Oct	49.9	.5	2.06	1.46
Nov	39.1	6.0	.42	-.01
Dec	22.6	.7	.46	.14
<b>Total</b>			<b>13.44</b>	<b>-.38</b>
Jan 1981	29.8	14.9	.02	-.41
Feb	29.0	8.5	.07	-.31
Mar	41.3	10.9	.34	-.19
Apr	52.0	5.6	.58	-.68
May	59.7	1.9	.97	-.87
Jun	65.2	-.7	2.18	-1.29
Jul	75.7	1.7	1.79	-.09
Aug	75.9	3.7	1.61	-.02
Sep	64.5	4.3	.42	-.63
Oct	48.6	-.8	1.09	.49

Source: U.S. Department of Commerce 1980-1981

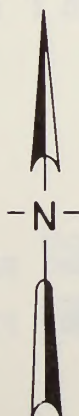
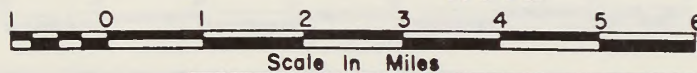


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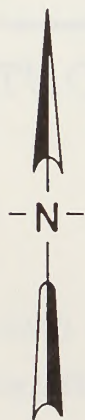
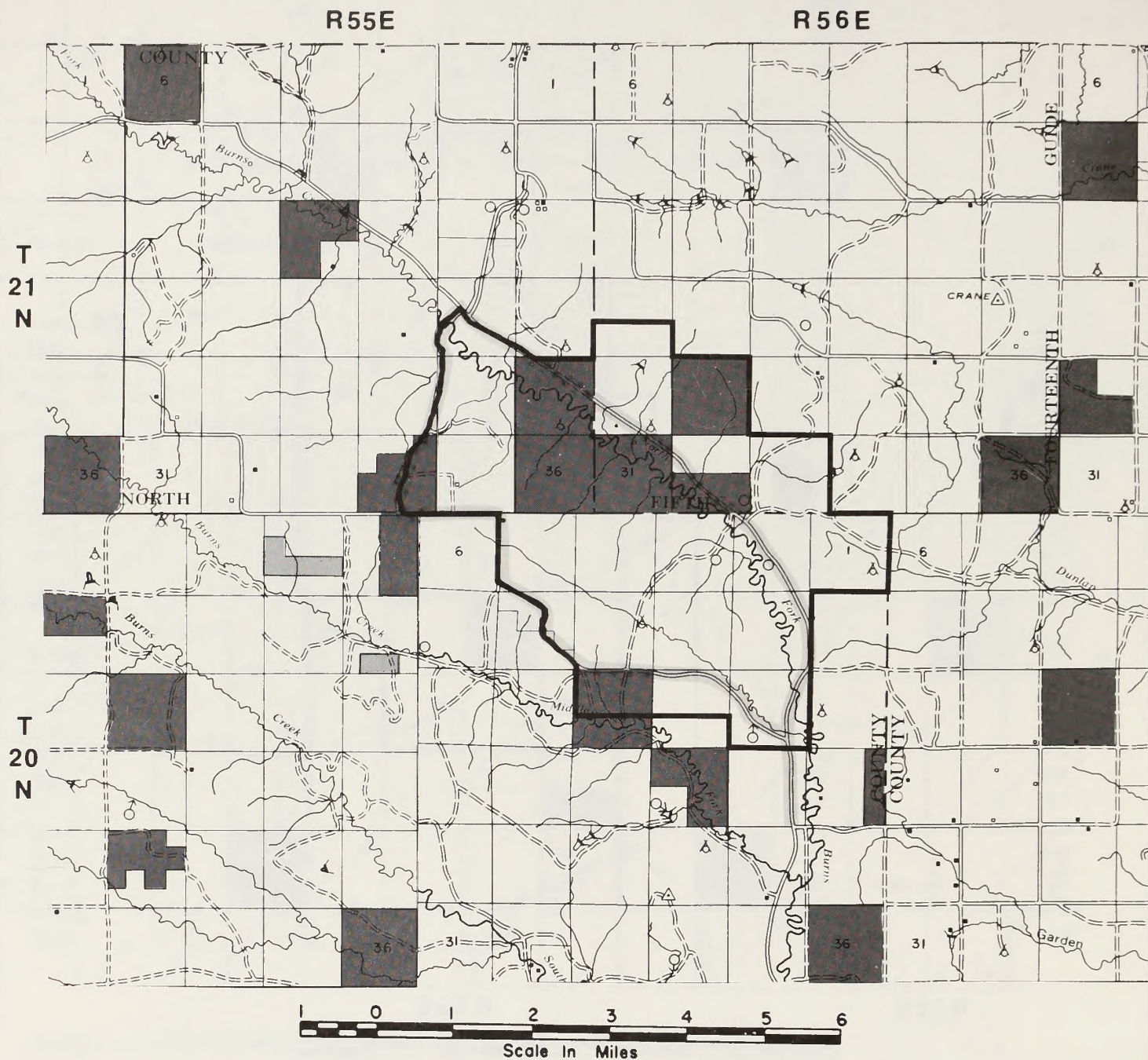


## WINDSHIELD SURVEY ROUTE

-  BLM LAND
-  STATE LAND

APPENDIX C





## WINDSHIELD SURVEY ROUTE

- BLM LAND
- STATE LAND

APPENDIX D

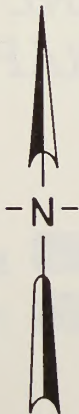
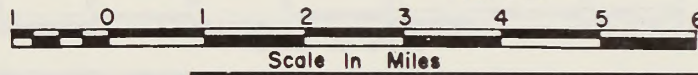


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## BIRD ROUTE AND SMALL MAMMAL TRAP SITES

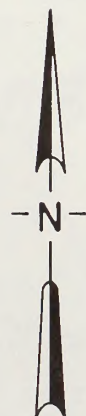
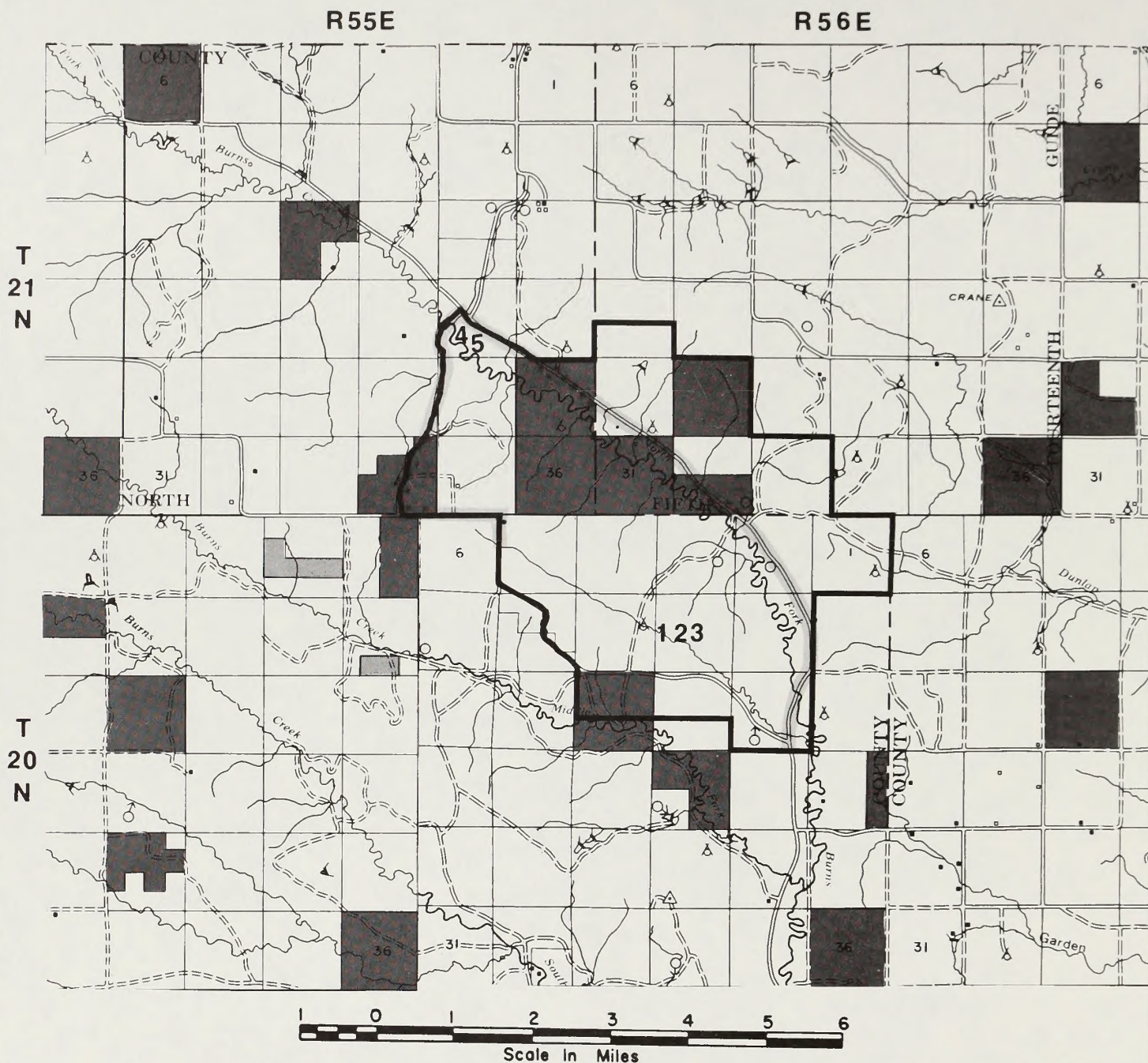
### LEGEND

-  Bird Route
- 1 Woody Draw
- 2 Badlands
- 3 Grassland
- 4 Creek
- 5 Agriculture

-  BLM LAND
-  STATE LAND




APPENDIX E





## BIRD ROUTE AND SMALL MAMMAL TRAP SITES

### LEGEND

- |   |             |   |            |
|---|-------------|---|------------|
|  | Bird Route  |  | BLM LAND   |
| 1   | Woody Draw  |  | STATE LAND |
| 2   | Badlands    |   |            |
| 3   | Grasslands  |   |            |
| 4   | Creek       |   |            |
| 5   | Agriculture |   |            |

APPENDIX F



## APPENDIX G

### MULE/WHITE-TAILED DEER PRODUCTION AND POPULATION CHARACTERISTICS ON THE STUDY AREA

	DATE	MALE	FEMALE	YOUNG	TOTAL
Bloomfield Mule Deer	Nov '80	—	1	2	3
	Sept-Oct '81	1	8	5	14
North Fork Mule Deer	Nov '80	—	5	5	10
	Sept-Oct '81	—	3	1	4
Bloomfield White-tailed Deer	Nov-Dec '80	3	33	41	76
	Sept-Oct '81	2	11	9	22
North Fork White-tailed Deer	Nov-Dec '80	1	3	5	9
	Sept-Oct '81	—	1	1	2



## **APPENDIX H**

### **DEER HARVEST STATISTICS FOR HUNTING DISTRICT 732**

<b>Species</b>	<b>1980</b>	<b>1979</b>
White-tailed Deer	742	547
Mule Deer	513	267
Combined*	1259	823

\*Discrepancy is either-species deer hunters that did not report which species they killed.



## APPENDIX I

### SHARP-TAILED GROUSE ARENAS AND NUMBER OF MALES OBSERVED

GROUND	LOCATION	MAXIMUM COUNT OF MALES <sup>1</sup>
<b>Bloomfield</b>		
1	T20N, R53E, Sec. 18 middle	16
2	T20N, R53E, Sec. 20 E1/2	9
<b>North Fork</b>		
3	T20N, R56E, Sec. 2 NW1/4	9
4	T20N, R56E, Sec. 10 SW1/4	13
5	T20N, R56E, Sec. 16 N1/2	5
6	T21N, R55E, Sec. 22 NE1/4	20
7	T21N, R55E, Sec. 25 NW1/4	13
8	T21N, R56E, Sec. 30 SW1/4	17
9	T21N, R56E, Sec. 32 middle	13

<sup>1</sup>Maximum count as derived from two or more visits.



## **APPENDIX J**

### **BIRDS IDENTIFIED ON THE BLOOMFIELD BIRD ROUTE**

Red-tailed Hawk  
Marsh Hawk  
American Kestrel  
Ring-necked Pheasant  
Killdeer  
Mourning Dove  
Eastern Kingbird  
Western Kingbird  
Horned Lark  
Barn Swallow  
Black-billed Magpie  
Common Crow  
House Wren  
Rock Wren  
Gray Catbird  
Brown Thrasher  
American Robin

Loggerhead Shrike  
Starling  
Yellow Warbler  
House Sparrow  
Bobolink  
Western Meadowlark  
Red-winged Blackbird  
Northern Oriole  
Brown-headed Cowbird  
American Goldfinch  
Rufous-sided Towhee  
Lark Bunting  
Grasshopper Sparrow  
Vesper Sparrow  
Lark Sparrow  
Chipping Sparrow  
Chestnut-collared Longspur



## APPENDIX K

### SUMMARY OF BREEDING BIRD SURVEY RESULTS SAVAGE ROUTE, 1968-1981

SPECIES	7/5/68	6/11/69	7/7/70	7/1/72	6/28/77	7/7/78	6/22/79	6/13/80	6/24/81
Eared Grebe	—	—	—	—	—	1/1	—	2/1	—
Pied-billed Grebe	—	—	—	—	—	—	—	2/1	—
Mallard	—	—	—	2/2	6/1	5/4	6/3	11/2	15/3
American Wigeon	—	—	10/1	—	9/1	—	1/1	2/1	—
Shoveler	—	—	—	—	—	—	3/1	—	—
Redhead	—	—	—	—	—	—	—	1/1	—
Ruddy Duck	—	—	—	—	—	—	—	2/1	—
Blue-winged Teal	—	1/1	—	2/2	13/1	2/2	—	—	—
Green-winged Teal	—	—	—	—	—	6/1	—	—	—
Golden Eagle	—	—	2/1	1/1	1/1	—	—	—	—
Red-tailed Hawk	—	—	—	—	—	—	—	1/1	—
Swainson's Hawk	—	—	—	—	—	—	1/1	1/1	—
Marsh Hawk	—	2/2	1/1	4/4	1/1	2/2	1/1	—	1/1
American Kestrel	2/2	1/1	2/2	1/1	4/4	1/1	7/5	3/2	2/2
Prairie Falcon	—	—	—	—	—	—	—	—	1/1
Sharp-tailed Grouse	24/2	1/1	10/1	1/1	8/5	—	—	9/3	4/2
Ring-necked Pheasant	—	3/2	—	5/5	16/12	9/8	11/11	10/8	13/9
Gray Partridge	—	—	—	—	—	—	2/1	2/1	—
American Coot	—	—	—	—	—	—	1/1	—	2/1
Killdeer	1/1	3/3	4/3	8/7	14/7	8/4	15/8	24/13	12/16
Long-billed Curlew	—	—	—	—	1/1	—	—	—	—
Upland Plover	—	—	4/1	—	3/2	—	1/1	—	—
Common Snipe	—	—	—	1/1	—	—	—	—	—
Wilson's Phalarope	—	—	—	6/1	—	—	—	—	—
Rock Dove	—	—	—	—	—	—	—	2/1	—
Mourning Dove	53/19	41/22	22/8	18/16	75/30	61/26	111/32	69/33	54/23
Great Horned Owl	—	—	—	—	—	—	1/1	—	—
Black-billed Cuckoo	—	—	—	—	—	3/3	—	—	—
Short-eared Owl	—	1/1	2/2	—	—	—	1/1	—	—
Common Nighthawk	12/8	—	—	3/2	1/1	1/1	1/1	2/2	3/2
Common Flicker	3/2	1/1	2/1	1/1	12/8	4/4	—	2/2	3/1
Eastern Kingbird	25/17	4/4	15/11	14/10	15/11	13/10	12/7	19/12	7/7
Western Kingbird	8/5	1/1	2/2	4/2	4/2	3/3	5/3	—	1/1
Western Flycatcher	—	—	—	—	—	—	—	1/1	—
Say's Phoebe	2/2	—	—	1/1	3/3	—	2/1	—	1/1
Western Wood Pewee	—	—	—	—	1/1	—	—	—	—
Horned Lark	8/5	48/16	33/15	36/21	36/20	38/14	66/23	46/20	34/15
Rough-winged Swallow	—	—	—	—	3/2	9/5	—	2/1	1/1
Bank Swallow	—	—	1/1	—	—	—	—	—	—
Barn Swallow	—	4/2	6/4	3/3	3/3	11/7	16/8	17/9	15/8
Cliff Swallow	—	—	6/1	—	11/2	1/1	2/1	1/1	—
Black-billed Magpie	—	—	—	—	—	2/2	—	—	—
Common Crow	—	—	—	2/1	7/5	2/2	12/8	1/1	2/2
House Wren	—	—	—	—	—	3/3	—	5/4	4/4
Rock Wren	—	—	—	—	1/1	—	—	—	—
Catbird	—	1/1	—	3/3	—	—	2/1	—	1/1
Brown Thrasher	4/4	4/4	2/2	3/2	1/1	3/3	18/13	13/11	6/6
Robin	3/2	4/3	3/3	2/1	6/6	4/4	9/6	11/7	5/5
Mountain Bluebird	—	—	—	—	1/1	2/1	—	—	—



## APPENDIX K (cont.)

### SUMMARY OF BREEDING BIRD SURVEY RESULTS SAVAGE ROUTE, 1968-1981

SPECIES	7/5/68	6/11/69	7/7/70	7/1/72	6/28/77	7/7/78	6/22/79	6/13/80	6/24/81
Loggerhead Shrike	4/2	4/4	11/7	2/2	7/6	4/4	3/3	2/2	7/7
Yellow Warbler	—	—	—	—	1/1	11/7	17/8	17/9	13/7
Yellowthroat	—	—	—	—	1/1	3/3	—	—	—
Yellow-breasted Chat	—	—	—	—	2/2	2/1	—	—	—
Starling	—	3/1	—	—	—	—	10/3	4/2	5/1
House Sparrow	—	—	—	—	—	—	—	—	—
W. Meadowlark	153/41	339/48	127/39	75/39	173/49	297/50	363/50	305/50	348/50
Yellow-headed Blackbird	—	—	—	—	—	—	—	—	2/2
Red-winged Blackbird	5/2	10/2	21/9	20/11	27/13	27/13	54/24	36/14	27/15
Orchard Oriole	—	—	—	—	—	—	—	1/1	—
Northern Oriole	—	—	—	—	—	1/1	—	—	—
Brewer's Blackbird	—	10/5	30/13	—	33/10	1/1	28/10	32/13	14/6
Common Grackle	—	—	—	—	2/1	1/1	—	—	—
Brown-headed Cowbird	13/3	6/3	9/4	17/7	10/8	56/21	37/11	33/20	42/17
Western Tanager	—	—	—	—	—	1/1	—	—	—
Black-headed Grosbeak	—	1/1	—	—	—	—	—	—	—
American Goldfinch	1/1	—	—	—	11/8	8/2	5/2	2/1	12/5
Rufous-sided Towhee	—	—	—	1/1	7/4	2/2	4/2	1/1	5/5
Lazuli Bunting	—	—	—	—	2/2	—	—	—	—
Savannah Sparrow	—	—	—	—	—	—	1/1	—	—
Grasshopper Sparrow	—	—	2/1	4/4	12/10	20/12	8/7	7/4	2/2
Lark Bunting	30/16	71/31	16/6	12/6	1/1	18/12	18/9	1/1	30/10
Vesper Sparrow	17/13	—	51/22	31/21	38/31	6/4	3/3	42/22	46/27
Lark Sparrow	16/9	21/12	27/19	—	5/3	1/1	5/3	1/1	6/5
Chipping Sparrow	—	—	1/1	—	—	2/1	—	—	—
Field Sparrow	—	—	—	—	17/12	1/1	—	—	—
Brewer's Sparrow	—	—	31/18	—	—	—	—	—	—
Song Sparrow	—	—	11/7	—	—	—	4/1	—	—
Chestnut-collared Longspur	—	—	—	—	—	2/2	—	—	—
Unidentified Hawk	—	—	—	—	—	1/1	—	—	—
<b>Total</b>									
<b>Species/Individuals</b>	<b>20/384</b>	<b>25/585</b>	<b>30/464</b>	<b>30/283</b>	<b>44/605</b>	<b>45/659</b>	<b>40/869</b>	<b>41/745</b>	<b>36/746</b>

Numbers are: Total number of birds observed/number of stops at which observed.



## APPENDIX L

### BIRDS IDENTIFIED ON THE NORTH FORK BIRD ROUTE

American Bittern  
Gadwall  
American Wigeon  
Blue-winged Teal  
Red-tailed Hawk  
Marsh Hawk  
Prairie Falcon  
American Kestrel  
Sharp-tailed Grouse  
Ring-necked Pheasant  
American Coot  
Killdeer  
Mourning Dove  
Common Nighthawk  
Common Flicker  
Eastern Kingbird  
Western Kingbird  
Say's Phoebe  
Horned Lark  
Rough-winged Swallow  
Barn Swallow  
Black-billed Magpie  
Common Crow

House Wren  
Rock Wren  
Brown Thrasher  
American Robin  
Mountain Bluebird  
Loggerhead Shrike  
Starling  
Yellow Warbler  
House Sparrow  
Western Meadowlark  
Yellow-headed Blackbird  
Red-winged Blackbird  
Northern Oriole  
Brewer's Blackbird  
Brown-headed Cowbird  
American Goldfinch  
Rufous-sided Towhee  
Lark Bunting  
Grasshopper Sparrow  
Vesper Sparrow  
Lark Sparrow  
Chipping Sparrow  
Field Sparrow



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